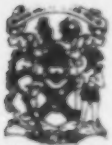


ANNUAL REPORT

for the fiscal year
ending March 31, 1984

Department of Lands and Forests

REPORT OF THE MINISTER OF LANDS AND FORESTS

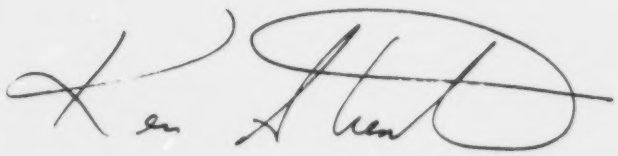
To His Honour

The Honourable Alan R. Abraham, C.D.
Lieutenant-Governor of Nova Scotia

May It Please Your Honour:

I have the honour to submit herewith the report of the Department of Lands and Forests for the fiscal year ended March 31, 1984.

Respectfully submitted,



Ken Streatch
MINISTER OF LANDS AND FORESTS

REPORT OF THE
DEPARTMENT OF LANDS AND FORESTS

The Honourable Ken Streatch
Minister of Lands and Forests
Halifax, Nova Scotia

Sir:

I have the honour of presenting the Report of the Department of Lands and Forests for the fiscal year ended March 31, 1984.

Respectfully submitted,

D. L. Eldridge

D. L. Eldridge
DEPUTY MINISTER

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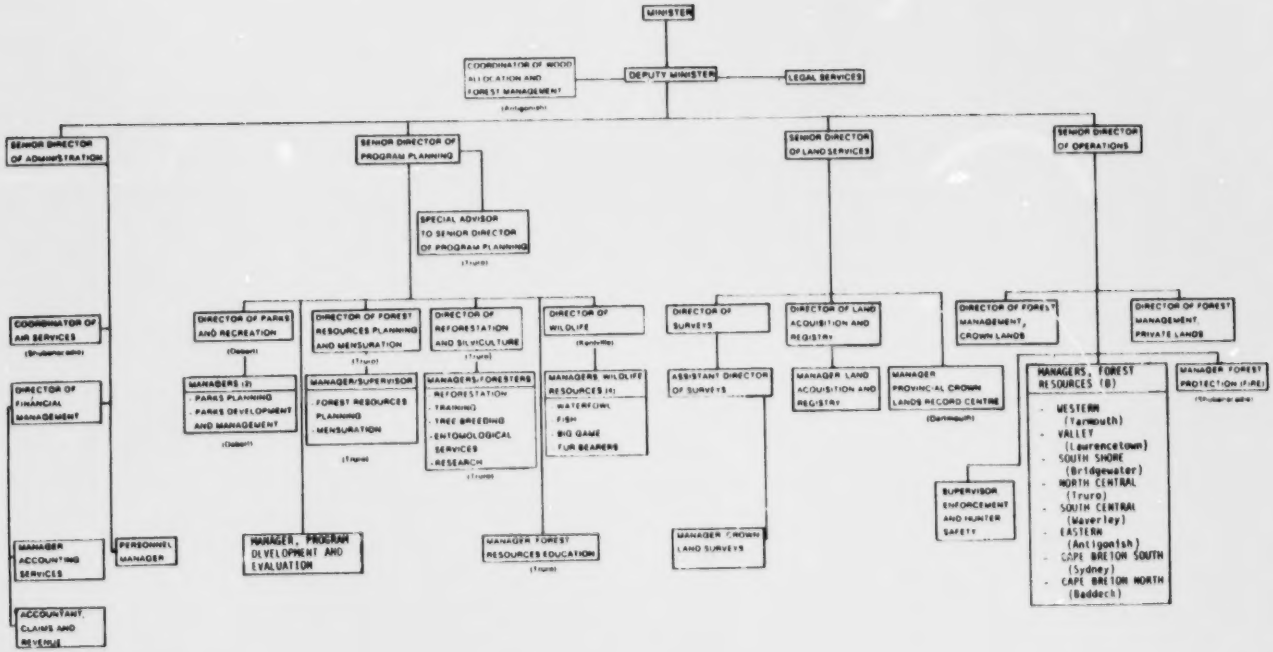
FIG. 1

MANAGEMENT ORGANIZATION
DEPARTMENT OF LANDS AND FORESTS
PROVINCE OF NOVA SCOTIA



Note: All positions located in Halifax unless otherwise shown

DEPARTMENT OF LANDS AND FORESTS
P.O.Box 698
Halifax, Nova Scotia
B3J 2T9

MINISTER
Hon. Ken Streatch
424-4037

DEPUTY MINISTER
D.L.Eldridge
424-4121

DEPARTMENTAL FUNCTION AND ORGANIZATION

The Department of Lands and Forests was established by legislation enacted in 1926. It is charged with administering the Lands and Forests Act and various other statutes, including the Beaches Preservation Parks Act.

From these Acts it derives authority to manage Crown lands, to provide a system of parks, and to protect the forests, wildlife, and beaches. Inherent in the legislation and incumbent upon the department are responsibilities pertaining to the productivity of the forests generally, the implementation of forest management programs, the supply of forest products, public education, and the enhancement of recreational and scenic values. The department also assists federal agencies in enforcing the Migratory Birds Convention Act.

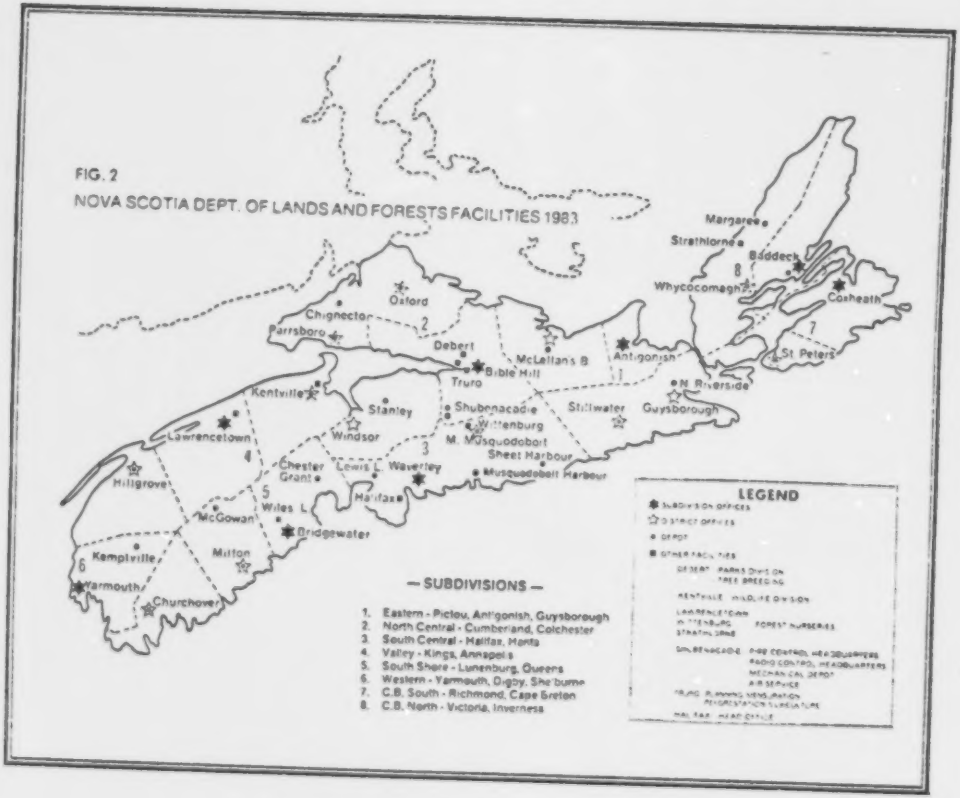
The functions and activities of the department are carried out through four branches: Adminstration, Operations, Program Planning, and Land Services. This structure is shown in Figure 1. Unless otherwise indicated, functions are located in Halifax (P.O.Box 698, Halifax, Nova Scotia B3J 2T9). The department is well decentralized with staff and facilities located in all municipalities (Figure 2).

BOARDS, COMMISSION, AND AGENCIES

NOVA SCOTIA FOREST PRACTICES IMPROVEMENT BOARD
Suite 210
Queen Square
45 Alderney Drive
Dartmouth, N.S.
(424-5443)

FIG. 2

NOVA SCOTIA DEPT. OF LANDS AND FORESTS FACILITIES 1983



This board administers the Forest Improvement Act, which includes carrying out programs of education for good forest practice, recommending cutting practices, and generally using its authority to encourage better forest management practices.

NOVA SCOTIA PULPWOOD MARKETING BOARD

Suite 210
Queen Square
45 Alderney Drive
Dartmouth, N.S.
(424-7598)

This board is responsible for administering the Pulpwood Marketing Act. The purpose is to regulate the marketing of pulpwood on behalf of producers and buyers in the province.

ROYAL COMMISSION ON FORESTRY

This three-man commission, appointed on May 6, 1982 to inquire into the forest industry in Nova Scotia, continued its work in 1983-84. From April 1, 1983 to March 31, 1984 a total of 27 presentations were made to the commission during nine public hearings held in Halifax, Liverpool and Baddeck. The commissioners also made a number of field trips to see forestry operations and facilities.

The commissioners expect to complete their report and submit their findings by December, 1984.

ACTS ADMINISTERED BY THE DEPARTMENT OF LANDS AND FORESTS

1. Beaches and Foreshores Act
2. Beaches Preservation and Protection Act
3. Blueberry Associations Act
4. Bowaters Mersey Agreement Act
5. Forest Improvement Act
6. Indian Lands Act
7. Kedgemakooge National Park Act
8. Land Holdings Disclosure Act
9. Land Titles Clarification Act
10. Lands and Forests Act
11. Nova Scotia Pulp Limited Agreement Act
12. Parks Development Act
13. Provincial Parks Act
14. Pulpwood Marketing Act
15. Scalers Act
16. Scott Maritimes Pulp Limited Agreement Act, 1965
17. Surveys Act (not proclaimed)
18. Trails Act (not proclaimed

ADMINISTRATION BRANCH

424-6694

The Administration Branch is responsible for financial management, personnel, adminstration, and air services, as well as for impiementing administrative policies and procedures on behalf of the deputy minister and minister.

It is composed of three divisions: Financial Management, Personnel Administration, and Air Services.

FINANCIAL MANAGEMENT

The Financial Management Division develops financial systems and procedures and provides financial information to all branches of the department and control agencies of government. They assist in the preparation of the departmental expenditure estimates and prepare the revenue budget. They also manage and process departmental accounts payable, administer the collection of revenue, and are responsible for the distribution and sale of game and fishing licenses.

Expenditures and Revenues
1983-84

ORDINARY EXPENDITURES

Administration Branch

Office of Minister and Deputy	$305,761	
Administrative Services	93,486	
Financial Management	645,616	
Game Licenses	225,490	
Personnel and Payroll	112,867	
Legal Services	67,281	
Air Services	1,783,525	
Grants and Assistance	131,400	
Forest Operators Assistance	875,000	
Forest Practices Improvement Board	47,648	$4,288,074

Program Planning Branch

Administration		
Branch Administration	$187,701	
Urban Forestry	25,120	
Forest Resources Education	301,042	
Reforestation and Silviculture		
Division Administration	117,725	
Forest Nurseries	1,554,230	
Silviculture Training	158,245	
Tree Breeding	467,441	
Insect and Pathogens Protection	736,769	
Forest Resource Planning and Mensuration		
Administration and Services	283,302	
Resource Management Planning and Coordination	285,750	
Forest Inventory	573,595	
Timber Loan Board	29,635	
Scaling	39,394	
Wildlife Management		
Wildlife Management Planning	549,391	
Inland Fisheries	215,806	
Wildlife Parks	549,642	$6,074,788

Operations Branch

Administration		
Administration	$466,673	
Silviculture Agreements	175,345	
U.I. Job Creation Program	988,564	
Provincial Employment Program	12,180	
Field Services		
Administration	1,999,274	
Forest Protection	1,917,789	
Enforcement and Hunter Safety	534,514	
Parks Maintenance and Operation	1,028,980	
Extension and Training	70,022	
Private Land Forest Management	1,017,049	
Wildlife Management	403,092	

Crown Land Forest Management	1,922,015	
Properties, Vehicles and Equipment	886,201	
Provincial Employment Program—Parks	12,173	
Provincial Depot		
Administration	160,428	
Fire Control	515,870	
Mechanical Equipment	502,220	
Support Services	233,143	
Radio Communications	1,397,625	$14,225,157
Land Services Branch		
Administration	$66,902	
Land Acquisition and Registry Division	552,913	
Surveys Division	849,067	
Provincial Crown Lands Record Centre	198,495	$1,667,377
TOTAL		$26,255,396
Forest Resource Development Agreement[1]		$1,854,762
Royal Commission on Forestry[2]		167,981
		$28,278,139
Ordinary Recovery Detail		
Program Planning		
Forest Resources Education	$1,882	
Insect and Pathogens Protection	163,907	
Operations		
U.I. Job Creation Program	794,290	$960,079

1. Funds budgeted in the Department of Development
2. Funds budgeted under Public Service

CAPITAL EXPENDITURE

Furniture and Equipment

Firefighting Equipment	$179,578	
Forestry Equipment	78,166	$257,744

Other

Program Planning		
Parks and Recreation	$923,976	
Forest Research	416,260	
Operations		
Operational Silviculture	302,061	
Crown Land Access Roads	154,979	
Land Services		
Land Acquisition	798,958	
Surveys	1,253,465	$3,849,699
Forest Resource Development Agreement[1]		$1,143,947
TOTAL		$5,251,390

1. Funds budgeted in the Department of Development

REVENUE

Admission Fees - Campgrounds	$253,258	
Fines and Forfeitures	85,801	
Games and Fishing Licenses	1,939,201	
Leases and Grants	24,758	
Nursery — Sale of Trees	444,630	
Selective Cutting	497,212	
Timber and Fuelwood Licenses	2,006,842	
Miscellaneous	123,675	$5,375,877

PERSONNEL ADMINISTRATION

The Personnel Administration Division is responsible for personnel and payroll documentation, recruitment and selection, staff training and development, administration of casual rates of pay, employee counselling and grievances and other personnel matters.

The number of civil service positions increased significantly over the year through the conversion of long-term casual employees to permanent civil service status. During the year, between 375 and 550 casual employees were on strength, depending upon the time of year, to assist in full-time programs of the department, to staff regular seasonal programs, or participate in employment creation programs.

The year saw the retirement of: Rupert Fisher, Supervisor of Mechanical Equipment, and Lloyd Scott, Mechanic, both of the Provincial Depot in Shubenacadie; Keith MacKay, Manager of Forest Resources in Waverley; Millan MacDonald, Special Projects Officer in New Glasgow; Mary Murphy, Administrative Assistant to the Office of the Deputy Minister in Halifax; Harold Hatfield, Supervisor, Forest Resources in Parrsboro; Frederick "Skip" Sturmy, Forester in Halifax; and Melvin "Curly" Selvet, Technician, Forest Resources in Coxheath.

AIR SERVICES

An air service is operated and maintained by the department for forest fire detection and suppression, aerial support in emergency situations, resource development and management, and transport of government personnel.

The fleet consists of four helicopters and three fixed-wing aircraft. All of the helicopters and one fixed-wing aircraft are equipped for water bombing.

During the year, the department's helicopters and fixed-wing aircraft flew a total of 235 hours on fire patrol and water bombing missions. The Air Service also was called on by Emergency Measures Organization (EMO) to carry out 42 searches for missing persons. The flying time for EMO amounted to 169 hours.

The department's Air Service also assists in policing game violations and in other related work.

WOOD SALVAGE/STORAGE AGREEMENT

During the period of this report the department sold 280 462 m^3 [stacked] (77,378 cords) of budworm-killed, softwood pulpwood, previously stored at roadside on the Cape Breton Highlands, to Nova Scotia Forest Industries for use in its mill. About 15 per cent of this wood had been debarked.

As of March 31, 1984 there were 586 900 m^3 [stacked] (161,923 cords) still stored at roadside in the Highlands. Approximately 40 per cent of the pulpwood still in storage has been debarked.

JOB CREATION PROGRAMS

The province again this year, in an effort to alleviate the high unemployment problem in some areas, undertook both summer and winter job creation programs. Some 429 jobs were created during the summer with an additional 196 jobs created during the winter program. Projects included park maintenance, boundary line renewal, park development, environmental clean-up, fuelwood culling, and silviculture.

In 1982, the province entered into a two-year agreement with Employment and Immigration Canada and the Canadian Forestry Service to enable persons drawing unemployment insurance to return to the workforce. In 1983, under this program, 613 jobs were created on various forestry-related projects throughout the province.

PROGRAM PLANNING BRANCH

424-4103

The Program Planning Branch is responsible for developing, evaluating, and recommending policy and program alternatives in forest management, and forest industry development. The branch is also responsible for the implementation of support programs, including forest nurseries, forest research, silviculture training, education and public information, wildlife parks, aerial insect protection programs, and entomological services.

This branch comprises four divisions and two subdivisions. The divisions are: Reforestation and Silviculture, Forest Resources Planning and Mensuration; Wildlife; and Parks and Recreation; located in Truro, Kentville, and Debert respectively. The Forest Resources Education subdivision is located in Truro, and the Forest Industry Development subdivision is in Halifax. Direction in each case is provided from the Halifax Head Office.

Reforestation and Silviculture Division. The Reforestation and Silviculture Division, P.O. Box 68, Truro, N.S. B2N 5B8 (895-1591), is responsible for planning and directing department programs which effectively increase and improve forest yields within the province. This includes tree breeding, forest nurseries, silviculture training, forest research, entomology, and aerial insect protection programs.

The Tree Breeding Centre (662-3300) is situated at Debert, and the forest nurseries are in the following locations:

Provincial Forest Nursery
P.O. Box 130
Lawrencetown, Anna. Co., N.S.
B0S 1M0

Strathlorne Forest Nursery
P.O. Box 489
Inverness, N.S.
B0E 1N0
258-2626

Wittenburg Forest Nursery
P.O. Box 250
Stewiacke, Col. Co., N.S.
B0N 2J0

Forest Resources Planning and Mensuration Division. The Forest Resources Planning and Mensuration Division, P.O. Box 68, Truro, N.S. B2N 5B8 (895-1591), is charged with maintaining a continuing forest inventory of all lands, land evaluation, scaling functions, and carrying out forest resources planning, which includes Crown land management planning, economic planning and roads engineering.

Wildlife Division. The Wildlife Division, P.O. Box 516, Kentville, N.S. B4N 3X3, (678-8921) is charged with appraising and evaluating the status and population trends of wildlife and inland fish species and with recommending harvest programs. The division also operates wildlife parks at Shubenacadie (Colchester County), Upper Clements (Annapolis County), and Two Rivers (Cape Breton County), and a fish-rearing station at Kelly Lake (Halifax County).

Parks and Recreation Division. The Parks and Recreation Division, RR#1, Belmont, N.S. B0M 1C0 (Debert) (662-3030), is responsible for conducting studies and preparing plans for the orderly development of a provincial parks and trails system as well as the construction program.

Forest Resources Education Subdivision. The Forest Resources Education Subdivision, P.O. Box 68, Truro, N.S. B2N 5B8 (895-1591), is responsible for a comprehensive education and technical information program for the general public and the department's staff.

Forest Industry Development Subdivision. The Forestry Industry Development Subdivision (424-7708), identifies, investigates, and analyses development opportunities for wood-using industries within the province; advises in related support programs; and provides technical advisory service to the sawn-products sector.

ADMINISTRATION

FOREST RESOURCES EDUCATION SUBDIVISION

This subdivision provides a central education and information service to staff and public. This is carried out through an enquiries desk, literature, a motion picture program and audio-visual library, production of exhibits, posters, and signs, special advertising. courses, and walks and talks. This service complements and supports the extension public information function performed by all staff. Full-time staff consists of one forester, one

wildlife biologist, one technical writer, one field representative and two clerical support staff.

Public demand for information on all aspects of forest resources, especially forests and wildlife, is generally increasing.

Enquiries and Literature

Written and telephoned requests are answered by personal letter or by card, using literature from a list of about 90 titles on hand. We depend increasingly on our two periodicals — the quarterly wildlife magazine *N.S. Conservation* and the bimonthly forestry newsletter *Forest Times* — to provide information once supplied by individual publications. (Readers get the benefit of up-to-date information, and the department saves by buying and distributing reprints.) During the year a combined total of 140,000 copies were mailed to individuals. As of March 31 the *N.S. Conservation* mailing list stood at 17,436, and was recovering from a 23 per cent drop following a January subscription renewal. *Forest Times* stood at approximately 9,000, with bulk mailings bringing the total to 10,000. We also serviced 1,108 individual requests for literature, mailed six issues of *Technical Notes*, and looked after publishing and distributing the annual *Forest Products Directory*, *Trappers Newsletter* and the department's annual report.

Other mailouts included National Wildlife Week kits (including locally-designed material for the press), National Forest Week materials, herbicide trial reports, our new eagle poster (10,000) and special crests to reward deer management cooperators. Ten issues of *Woodland Notes* (press and magazine clippings) were distributed to a small readership. The staff newsletter *Woodpecker's Post* was discontinued for lack of material. The publications list was updated twice, and a Personal Fishing Record was printed for anglers. Summaries of hunting, fishing and trapping regulations were prepared for publication. In all, 184,555 pieces of literature were distributed.

The manager acted as general editor for the department's submission to the Nova Scotia Royal Commission on Forestry. He assisted with the publication of the Wood Property Report and with a new full-color field handbook prepared by the Forest Research Section. Editing of Ralph Johnson's forest history was contracted out and was two-thirds complete by year-end. Information and support were provided for a privately produced *Forest Industries Directory*, the first of its kind for Nova Scotia.

Audio-Visual

Working through the Department of Government Services, the Forest Resources Education Subdivision produces, on the average, one 16mm motion picture a year. Since these are of varying lengths and complexity, there is usually more than one in progress.

Film

'Eagles of Bras D'Or', an 18 minute, 16mm film was completed, with a premiere slated for early in 1984-85. The film will be available for use by staff, teachers, public and media through the film libraries of the Lands and Forests, Education and Government Services departments. 'Barrington Log Drive' (working title), an historical film being co-produced with the National Film Board, was rough-edited for completion in fiscal '84-85. In consultation with Fire Control Headquarters and the Department of Government Services, a film outline and proposed script was prepared for a firefighting film. Wet weather postponed any filming. Film footage of Nova Scotia eagles was sold to New Jersey for a film about their eagle introduction program, which involved our department.

Slide Sets

Presenters to the Royal Commission were assisted with their slide talks. In cooperation with Government Services, interviews were conducted for the voice track of a slide tape set on trapping to be completed in 1984-85. The Council of Maritime Premiers was assisted in the preparation of a set on forestry careers. A set of slides on log-driving was purchased from NFB. Slides and black and white photography was conducted on various wildlife projects for publication and file.

Audio Tapes

As part of an historical forestry exhibit seven interviews were conducted in Lunenburg County with oldtime forest workers.

Computer Games

Input was provided on request for four video forestry games being produced by the Canadian Forestry Service (CFS) for school use across Canada.

School Program

About 20 new films were previewed; 10 were purchased for the library. Fourteen old titles (27 prints) were discontinued. Estimated showings to school and adult audiences were 950; total audience was 76,000.

Many of the duties of the A/V Supervisor (who retired in 1982) were taken on by the biologist — film repair and cleaning, projector and equipment maintenance and loaning, discarding old film prints and cataloguing new films. Film booking and lending has been added to the existing clerical workload.

Media and Advertising

Appropriate print ads were developed and placed in *Atlantic Business*, *Farm & Forest*, *Cape Breton's Magazine*, the *Forest Industries Directory*, and *The Chronicle-Herald*.

Three radio fire-prevention ads were developed and aired province-wide during July and August. The animated 'Moose Cafe' forest fire prevention commercial was aired on television during June and July. The Land Resources Coordinating Committee of Voluntary Planning was assisted with input and funds.

A television advertising campaign encouraging hunters to ask permission was developed with a 60- and 30-second commercial. Radio advertisements for National Wildlife Week were bought and aired in March.

The biologist wrote and distributed press releases on fish stocking, eagle nests in Halifax County, the new eagle film, Liscomb Sanctuary, compulsory hunter orange and the new deer tag system.

Exhibits/Signs/Posters

'Oldtime Woods Ways', an exhibit featuring captioned photos, artifacts, audio tapes and a slide set, was displayed with the help of Operations staff at these exhibitions: South Shore, Halifax County, Provincial, Cumberland County and Hants County as well as at the annual meetings of the N.S. Forest Products Association, and the Social Studies Teachers Association. A fund was set up for buying forestry artifacts. A contract was let through Government Services to develop and construct a major display for the first Nova Scotia Forestry Exhibition, to be held in June 1984 at Windsor.

A lake survey exhibit was loaned to the Sydney Wildlife Association, and an exhibit about coyotes and sheep was prepared and manned for the Sheep Fair in Truro. A deer-and-fawn mount and young coyote mount were prepared on contract for future exhibitors. Bird-of-prey study skins were prepared by a taxidermist for a future Nova Scotia Museum school loan kit. A small lobby display was regularly changed at the Truro headquarters. As a classroom aid to accompany our new film, a poster was prepared and printed about eagles in Nova Scotia. A poster was developed on hunter/landowner cooperation to reinforce the television campaign. Woodlot management signs were produced for Sissiboo Forest Management Ltd. of Digby.

Teacher Training/Curriculum Enrichment

Considerable time was spent facilitating the 1983 summer school course 'Forest Ecology for Teachers', held this year at Antigonish and Lawrencetown (Annapolis County). Meetings were held with Department of Education and Maritime Resource Management Services staff on revising our out-of-print *Book of Maps* for school use. The Nova Scotia Museum's Forestry Kit (developed with department help in 1980-81) is in active use as evidenced by the need to replenish the tree-growing component annually. This is done through our Tree Breeding Centre.

The manager gave two talks at the N. S. Teacher's College, conducted two forestry workshops at the Primary and Elementary Teacher's Association autumn in-service, was interviewed by Dalhousie University for a unit on forestry careers, and spoke with 80 day-care workers on how to introduce children to nature. A script was prepared under contract for a new high school forestry play to be staged in 1984. Assistance was given to the CPPA's 'People of the Forest' curriculum project. The biologist conducted a lab for the ecology class at the Agricultural College, and gave an all-day in-service for primary and elementary teachers.

Wildlife and Forest Management

A developing role for the biologist has been to provide wildlife input for forest management planning on Crown lands. To this end, field trips were taken with planning staff to Yarmouth and Antigonish, a wildlife plan was written for the Valley Subdivision and plans were started for a demonstration site at Chignecto.

Miscellaneous

Four walks were conducted for about 100 children. The manager attended a National Forest Week planning session of the Canadian Forestry Association in Toronto and a CFS information and education workshop in Petawawa, Ont.

Following a fact-finding tour of the province, the manager and the *Forest Times* editor prepared a brief for the Public Education and Information Project of the Forest Resources Development Agreement. Monthly meetings of forestry educators (FORED) were arranged, with tree-planting and other projects being initiated or coordinated. One article was written and published in *Home & Country*, official newsletter of the Women's Institute of Nova Scotia. The manager attended two computer short courses.

The biologist attended fortnightly meetings with the Land Resources Coordinating Committee, a seminar on stream habitat protection, and a lumber grading course. He also attended the annual meetings of the Wildlife Federation and the Trappers Association, and was sworn in as a game warden after a two-week law enforcement course.

A test for persons applying for a guide's license was prepared with the Halifax Office. The biologist made one appearance on the television show 'Switchback'.

FOREST INDUSTRY DEVELOPMENT SUBDIVISION

This service provides technical assistance to sawmill operators, and a liaison service with other provincial and federal departments on related matters. Numerous requests for assistance were responded to, providing detailed scaled drawings for sawmill layouts, training, instruction, saw alignment and various other forms of technical assistance.

Two sawmill tours with the Inventory Section were carried out to give better understanding of forest products processing. The supervisor also toured P.E.I. wood-burning installations on behalf of the Nova Scotia Forest Products Association.

Construction

Due to the economic situation, this year was a slow one in sawmill construction. The months of January, February, and March, however, were extremely busy with proposals for summer construction.

New Sawmills

Ledwidge Lumber - Halifax County	- long length mill
S.M. Gammon - Pictou County	- started construction
Jean Henshaw - Digby County	- new planing mill and rebuilt sawmill
Laurie Spidel - Lunenburg County	- relocated and rebuilt
Allison Worthen - Annapolis County	- new planing mill
Tim Barteaux - Annapolis County	- new planing mill
Charles Purdy - Cumberland County	- new sawmill

Dry Kiln

Harold Moore	- Kings County
Bill Deschamp	- Shelburne County

Fuelwood

Medway Forest Products - Queens County	- small P.T.O. chipper
Richard Neily - Hants County	- small P.T.O. chipper

Erfan Lumber Ltd. started work on a complete breakdown, grading and repackaging plant for their planing mill.

URBAN FORESTRY

To generate more interest in intensive management of forest and related vegetation in urban areas, a forester was assigned to provide technical advice to representatives of the province's cities, towns and villages. He helped them set up tree inventories and provided advice on pruning, establishment, removal and planting of trees. As more communities learn about this service, more are making use of it.

Literature, slides and movies are being put together to assist in this promotional program. Plans call for a survey of the municipalities to determine tree-care needs, followed by seminars and booklets on tree care. The forester is also responsible for contacting the municipalities to determine the present level of management, sources of funding and the needs for implementing and co-ordinating the Dutch Elm Disease Assistance Program.

Various federal job creation programs stimulated many municipalities to implement more intensive tree-care programs. At least 11 municipalities carried out woodlot improvement, street-side tree sanita-

tion, boundary line establishment and tree inventories. Other municipalities are setting up tree committees and beginning tree-care projects.

DUTCH ELM DISEASE ASSISTANCE

The Disease

Dutch Elm Disease (D.E.D.) is caused by an introduced fungus which plugs the sap-conducting vessels of native North American Ulmus species, causing wilting and death of affected parts. It was first detected in Nova Scotia at Liverpool in 1969 and is now found in at least 11 counties.

Control

No certain cure is known, but there are control measures which greatly lessen its effects. The City of Fredericton started a control program in the late 1950s which has restricted its losses to about 20 per cent compared to a loss rate as high as 90 per cent in surrounding areas with no control.

Present methods are aimed at prevention and control. The first objective is to keep elms healthy, vigorous and properly pruned. Sanitation — speedy removal of all dead and dying elms — is considered essential. Insecticides and fungicides have been used, but high cost and special equipment and skills restrict their use to high-value trees.

Assistance

The department has attempted to control the spread of D.E.D. by implementing a sanitation assistance program. In the mid-seventies a three-year assistance program was initiated to provide financial help to the municipalities. In fiscal 1980-81, 1981-82, 1982-83 and 1983-84 the province again provided such assistance.

The present program provides 50 per cent cost-sharing for sanitation work, allocated in the following order of priority: (1) municipalities with infected trees; (2) municipalities with trees near infected trees; and (3) other municipalities.

Nineteen municipalities participated in the program. The amount of assistance allocated to each is shown below:

Municipality	No. of Trees	Claim
Amherst	27	$500.00
Annapolis County	14	2,000.00
Annapolis Royal	3	1,000.00
Antigonish	10	1,500.00
Berwick	8	476.00
Colchester County	5	428.00
Digby	7	1,000.00
Halifax	23	2,000.00
Kings County	9	1,557.00
Lawrencetown	2	1,250.00
Middleton	5	1,500.00
New Glasgow	14	2,000.00
Oxford	35	2,000.00
Pictou	10	1,250.00
Stewiacke	7	659.46
Truro	10	1,000.00
Westville	11	1,000.00
Windsor	19	2,500.00
Wolfville	17	1,500.00
TOTAL	236	$25,120.46

Average cost per tree — $106.44

REFORESTATION AND SILVICULTURE DIVISION

TREE BREEDING

The Tree Breeding Section is charged with the responsibility of coordinating the overall Tree Improvement Working Group(TIWG) program, and of fulfilling the department's commitment to the project. Operational work is shared with the three industrial members: Bowater Mersey Paper Company Limited, Nova Scotia Forest Industries, and Scott Paper International, Inc. Technical and scientific expertise is made available through the Maritimes Forest Research Centre of the Canadian Forestry Service.

The Program objective is to supply reforestation projects in the province with genetically improved and tested seed by the year 2000. Improvement in the first cycle of breeding is expected to increase the growth rate of planted stands by 10-20 per cent — equivalent to 25-50 m^3/ha (3-6 cor-

ds/acre) extra yield at harvest. Additional benefits include increased resistance to disease, higher quality sawlogs, and improved fibre quality for pulping.

First-Generation Selection

Selection efforts in 1983 concentrated on bringing red and white spruce breeding populations up to target levels required for first-generation orchard establishment. This was successfully accomplished and most of these selections have been preserved by grafting.

Selection in black spruce continues to lag somewhat due to poor seed crops in recent years, although significant progress has been made. Arrangements were made to acquire seed from 80 additional selections made in New Brunswick. Selections from neighbouring Maritime provinces make up about half of those currently represented in black spruce seed orchards.

Plus-tree selection to date is summarized in Table 1.

Orchard Establishment

Grafted Orchards

White and red spruce are the main species for which grafted orchards are used, although some work is also carried out with Norway spruce and white pine. Orchard area for all species is summarized in Table 2. Total area of grafted orchard doubled in 1983.

The white spruce orchard managed by Scott Paper in East Mines, Colchester County, was expanded to 3.2 ha (7.9 acres) and extensive site preparation was carried out for additional expansion in 1984.

The Bowater Mersey red spruce orchard at Melvern Square, Annapolis County, received its first shipment of grafted trees. The new 0.5 ha (1.2-acre) orchard was officially opened.

The white pine and Norway spruce orchards originally established by the Tree Breeding in 1981 at Debert, Colchester County, were each expanded. Site preparation was also carried out on a nearby area for the initial establishment of a white spruce orchard in 1984.

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In cooperation with TIWG industrial members, a record-high grafting program was carried out early in 1984, with just under 10,000 grafts completed. These new grafts join the 10,000 already in transplant beds at the Tree Breeding Centre, where they are held for 2 to 3 years prior to shipment to orchard sites.

Seedling Seed Orchards

In cooperation with Nova Scotia Forest Industries a 2.8 ha (6.9-acre) seedling seed orchard was established at Strathlorne, Inverness County, to produce seed suitable for planting on the Cape Breton Highlands. Tree families represented in the orchard include single tree collections made in Highland black spruce stands as well as selected trees from nothern New Brunswick. Family tests of this material were established earlier at two planting sites on the Highlands. The Strathlorne orchard will later be rogued (poorer families removed) on the basis of growth performance evaluations made on the Highland test sites.

Additional seedling material was sown at the Tree Breeding Centre to expand the Scott Paper black spruce orchard at East Mines, and to establish a new orchard at NSFI's site near Aldershot, Kings County. Extra trees were sown for all untested families for establishment at test plantations. Seedlings for both the orchards and the test plantations are to be out-planted in the spring of 1985.

Other Breeding Studies

A final round of rooted cutting propagation was carried out over the winter months on 240 black spruce clones. The cuttings are to be established on four test sites in late summer of 1984 to evaluate stability of performance of identical genotypes grown in differing environments.

Laboratory analysis for a research project on wood properties of plus-trees was completed under contract with the University of New Brunswick, and a report is expected by the fall of 1984.

Seed Inventory and Testing

In addition to tree breeding responsibilities, the Tree Breeding Section is charged with inventory and quality monitoring of tree seed in storage for department use. This year some 191 active production seedlots and 909 research lots were stored. A total of 107 new production seedlots and 83 new research lots were received for storage; 56 seedlots were shipped to production nurseries and research users.

All new seedlots are tested for both physical quality and viability. Lots in long-term storage are tested regularly to monitor effects of storage on seed quality. Over 750 individual analyses were performed in the Tree Breeding Centre's lab.

A special project was initiated in cooperation with the national Tree Seed Centre at the Petawawa National Forestry Institute (PNFI), to investigate the causes of poor germination in Nova Scotia white spruce seedlots. Samples from 15 cone collections were processed by both commercial and research extraction facilities, and the seed was tested at both PNFI and the Tree Breeding Centre. A final report will be published in 1984.

Cooperator Review and Commitment

An internal report on progress of the cooperative tree breeding program and its future direction was prepared by department staff and circulated among members. Letters of commitment were requested by the Minister. Renewal of commitments should be completed early in fiscal year 1984-85.

Public Relations and Professional Development

Staff at the Tree Breeding Centre gave many tours to professional, educational and general interest groups during the year. Several interviews were given to radio, television, and newspaper reporters. A Maritime Nursery Manager's meeting was hosted by the Tree Breeding Section, featuring tours of both the centre at Debert and surrounding seed orchard areas.

Staff participated at several workshops and professional meetings, and made invited submissions to the biennial meeting of the Canadian Tree Improvement Association in Toronto and to a Tree Improvement Workshop held at the University of New Brunswick.

NURSERY OPERATIONS

Administration and Research

Nursery administration and research staff is responsible for allocating available planting stock equitably, consolidating nursery budgets, coordinating cone crop surveys and collections, initiating or carrying out research projects at all three nurseries, monitoring progress and providing advice and recommendations to section staff members.

TABLE 1.
PLUS-TREE SELECTION TO DECEMBER 31, 1983

	SELECTED JAN-DEC 1983					SELECTED PRIOR TO 1983					
SPECIES	L & F	MERSEY	NSFI	SCOTT	TOTAL	L & F	MERSEY	NSFI	SCOTT	TOTAL	GRAND TOTAL
wS	10	8	81	3	102	64	1	137	59	261	363
rS	8	44	10	22	84	93	159	26	158	436	520
bS	—	—	26	—	26	102	—	126	35	263	289
wP	4	2	—	—	6	38	—	6	1	45	51
jP	—	—	—	—	—	20	—	—	—	20	20
nS	—	—	—	—	—	82	—	—	—	82	82
TOTALS	22	54	117	25	218	399	160	295	253	1,107	1.325

TABLE 2.
Orchard Area Established by TWIG Up to end of 1983

Species	Cooperator	Location	Hectares	(Acres)	Type	Year Est.
white spruce	Scott	East Mines	2.2	(5.4)	Clonal	1981,83
	NSFI	MacQuarrie Lake Road	3.6	(8.9)	Half-sib	1978
red spruce	NSLF	Lawrencetown	1.6	(4.0)	Clonal	1977
	NSFI	Waterville	0.8	(2.0)	Clonal	1981
	Bowater	Melvern Square	0.5	(1.2)	Clonal	1983
black spruce	Scott	East Mines (eastern N.S.)	3.2	(7.9)	Half-sib	1982
	NSFI	Strathlorne (C.B. Highlands)	2.8	(6.9)	Half-sib	1983
Norway spruce	NSLF	Debert	1.1	(2.7)	Clonal	1981,83
white pine	NSLF	Debert	1.3	(3.2)	Clonal	1981,83
		Totals: Clonal -	7.5	(18.5)		
		Half-sib -	9.6	(23.7)		
		Grand Total -	17.1	(42.2)		

Nursery operations were somewhat disrupted in 1983 due to the controversy over the use of herbicides to protect plantations against competing vegetation.

Cancelled orders created surpluses; subsequent production cuts will cause future shortages. The surpluses caused additional planting on Crown land, plus increased transplanting. In spite of setbacks, distribution was up slightly over 1982:

Distribution by Nursery:	
Lawrencetown	3,889,612
Strathlorne	2,159,122
Wittenburg	371,260
Chignecto	52,975
	6,472,969

Distribution by User Agency:	
Crown	1,431,791
Large Private (Co)	2,632,706
FRDA	1,692,565
Small Private	661,875
Other	54,032
	6,472,969

Of the trees planted on Crown land and FRDA woodlots, 85,900 were planted by Boy Scout organizations.

Highland Spruce Production

Production of Cape Breton Highlands spruce now entails growing a crop of black spruce by means of vegetative propagation and a crop of white spruce from seed at our Strathlorne and Lawrencetown nurseries. The first large-scale planting will take place in the spring of 1984, when 100,000 black spruce will be planted. Five million Highland spruce should be available for planting in 1985.

Seed Procurement

In 1983, 375 hL (1,031 bushels) of cones were collected, but the seed yield had not been determined by fiscal year-end. Species and volumes collected were as follows:

Red spruce	41 hL	(112.75 bu.)
White spruce	64 hL	(176.00 bu.)
Highland spruce	48 hL	(131.00 bu.)
Black spruce	79 hL	(217.25 bu.)
Balsam fir	89 hL	(244.75 bu.)
Tamarack larch	48 hL	(129.25 bu.)
Jack pine	7 hL	(19.25 bu.)
Totals	375 hL	(1030.25 bu.)

Of the cones collected, 87 per cent came from private contractors and individuals technically assisted by Lands and Forests personnel.

In addition 50 kg (137.5 pounds) of red pine seed were purchased from the Ontario Ministry of Natural Resources.

Expansion and Development

To enable earlier removal of the winter greenhouse crops and thus earlier installation of the summer crops, shade houses were erected at the Lawrencetown and Strathlorne nurseries. The houses will also be used to provide shade for the summer crop when it is removed from the greenhouses in August. This work will be completed early in fiscal year 1984-85.

Training

Four staff members attended a Bareroot Update at the Maritimes Forest Ranger School; four attended the 'Reforestation in the Maritimes' symposium; one attended the Northeastern Area Nurserymen's Workshop, and six were enrolled in a Pesticide Applicator's Correspondence Course.

Public Relations

Nursery tours were conducted at all three nurseries for technical groups and individuals, special interest groups and the general public. A number of short talks were presented.

Reports and a Technical Note were prepared and circulated, and public enquiries were responded to in person, by telephone and through correspondence.

ENTOMOLOGICAL SERVICES

There are 23 pest detection officers (PDOs) and one biologist in the department. Three pest detection officers have been added from the Parks and Recreation Division and the one biologist has been added as a supervisor for the three PDOs in the North Central Subdivision. The PDOs assisted in a significant manner with the spruce budworm egg-mass survey, the spruce budworm moth migration survey, the gypsy moth pheromone trap surveys, and the gypsy moth egg-mass surveys.

The PDOs submitted 917 pest samples. The following is information on serious insect and pathogen pests.

Spruce budworm

Defoliation

Defoliation of balsam fir and spruce in softwood and mixedwood stands occurred on 357 600 ha (883,647 acres) in Nova Scotia. Defoliation was severe on 242 200 ha (598,488 acres); moderate on 52 000 ha (128,495 acres), and light on 63 400 ha (156,665 acres). The 294 200 ha (726,983 acres) of moderate and severe defoliation is a substantial increase over the 174 900 ha (432,187 acres) so affected in the province in 1982. Although in 1983 spruce budworm infestations existed at some level in a more or less continuous band along the northern shores of the province, the previously identified outbreak areas are discussed briefly to provide historical continuity in reporting.

In Colchester-Cumberland counties the area of severe and moderate defoliation increased to 177 500 ha (438,611 acres) in 1983 from 140 900 ha (348,171 acres) in 1982 and 100 800 ha (249,082 acres) in 1981. In 1983, severe defoliation occurred on 158 600 ha (391,909 acres), more than triple the 48 900 ha (120,834 acres) recorded the previous year.

On the Northumberland Strait coast area of Pictou and Antigonish counties, defoliation was severe or moderate on 54 700 ha (135,166 acres), much increased from 29 500 ha (72,896 acres) recorded in 1982 and 12 600 ha (31,135 acres) in 1981. While in 1982 most of the defoliation (97 per cent) in these categories was moderate, this year in more than two-thirds [38 200 ha (94,394 acres)] of the area, defoliation was recorded as severe.

In the Annapolis Valley-Hants County area, where only moderate defoliation occurred on 4 100 ha (10,131 acres) in 1982, defoliation was

severe on 29 900 ha (73,884 acres), moderate on 14 100 ha (34,842 acres), and light on 34 700 ha (85,745 acres) in 1983. The total defoliation of 78 700 ha (194,471 acres) is still considerably less, however, then the 136 200 ha (336,557 acres) affected in 1981.

On Cape Breton Island the following areas were recorded in various catagories of defoliation for 1983: severe, 15 500 ha (38,301 acres); moderate, 2 200 ha (5,436 acres); light, 500 ha (1,236 acres). The corresponding figures for 1982 were: severe, 0; moderate, 400 ha (988 acres); light, 12 300 ha (30,394 acres). However, in many of these areas tree mortality already exceeded 75 per cent. Defoliation occurred on the residual surviving trees, mostly on white spruce and occasionally on black spruce, as confirmed by ground checks (see Table V, Appendix).

Damage

An estimated 1.4 million m^3 (386,254 cords) of balsam fir and 0.5 million m^3 (137,948 cords) of spruce died in Nova Scotia in 1983 as a result of repeated defoliation by spruce budworm and attacks on spruce by the spruce beetle. The estimates were based on a damage assessment survey conducted by the Forest Insect Disease Survey of CFS.

Since 1976, mortality of merchantable balsam fir has been monitored on permanent research plots on both the Highland and Lowland areas of Cape Breton Island. Although spruce budworm populations have decreased drastically from those at the height of the outbreak, losses continued to mount, with many of the weekened trees falling victim to a complex of secondary organisms. On the Highlands, 76.9 per cent of the original trees had been lost by the fall of 1983, 65.9 per cent to mortality and 11.0 per cent to blowdown. The increase in total losses from 1982 was 5.3 per cent. On the Lowlands, where losses were much lower at the beginning of the outbreak, mortality accelerated during the last few years, and by the fall of 1983 had reached 84.6 per cent of the trees lost on the research plots.

Forecast

Egg-mass surveys indicate a dramatic downturn in spruce budworm infestations except in Kings County. But, although 1983 defoliation is expected to be less than in 1984, the budworm has not 'gone away'. Moderate to severe defoliation is likely in areas of Antigonish, Pictou, Cumberland, Kings and Annapolis counties (See Table VI, Appendix).

Spruce Beetle

Attacks by this pest continued in 1983. In Nova Scotia, the center of the outbreak has shifted west on Cape Breton Island. In some areas of the Margaree Valley an estimated 50 per cent of the white spruce was killed in 1983. Considerable mortality also occurred in areas of Victoria County, especially near Baddeck and North River Bridge. The shift in the outbreak means that no substantial areas remain on Cape Breton Island without severe white spruce mortality. Combined 1983 aerial and ground surveys estimated white spruce mortality at 22 per cent in Inverness, 17 per cent in Victoria, and 14 per cent in Cape Breton County. Including the 1983 losses, an estimated 37 per cent of the merchantable white spruce volume has died since the beginning of the current spruce beetle outbreak on Cape Breton Island. On the mainland, white spruce mortality occurred in pockets throughout, but was most common in Digby County.

Eastern Larch Beetle

This insect normally attacks only weakened, damaged, or recently felled host material. However, when populations are very high, living — apparently healthy — mature or overmature trees and even younger small-diameter trees can also become infested.

A population buildup was first noticed in Nova Scotia in 1976. This increase in beetle populations followed several years of severe defoliation of larch by the larch sawfly. Since then, the beetle has become widespread and has caused serious tree mortality. By the end of 1981, when the last detailed survey for this insect was conducted, an estimated 64 per cent of merchantable-size larch was dead in Nova Scotia.

Gypsy Moth

The gypsy moth, which reappeared in the Maritimes in 1981, gained further ground in 1983. It is now at least temporarily established in both New Brunswick and Nova Scotia. Gypsy moth has been the most destructive insect of hardwoods and to a lesser degree of conifers for decades in the northeastern United States. The expansion of the outbreak in Maine in the last few years has been a special concern.

The gypsy moth monitoring committee, formed in 1981, remained active in 1983 and again coordinated all surveys. Numerous government agencies and hundreds of private volunteers assisted in the most extensive pheromone trapping program ever conducted in the Maritimes. In addi-

tion, the New Brunswick Department of Environment was involved in discussions on control.

In Nova Scotia, larvae, pupae, or fresh egg masses were found in Yarmouth County at Yarmouth and Tusket; in Digby County at Grosses Coques and Digby; in Annapolis County at Paradise and in Kejimkujik National Park; in Kings County at New Minas; in Halifax County at Halifax; and in Shelburne County at Shelburne. The town of Shelburne, where 46 new egg-masses were found during surveys, appears to have the highest level of infestation in Nova Scotia.

Adult male trapping is aimed at defining areas where egg-mass searches should be concentrated. As a result of studies since 1980, the trap placement design was changed to eliminate or at least minimize interference from large numbers of male moths (females are flightless) brought into the region by weather fronts from infested areas in the United States.

In 1983 over 4,200 pheromone traps were used in the Maritimes, over 1,000 in New Brunswick, almost 3,000 in Nova Scotia, and 155 in Prince Edward Island. Of the traps used, only 2,562 or 60 per cent yielded information. The two main reasons for this are vandalism to traps and incomplete understanding of the value of 'negative' results by some cooperators. The modified system increased the accuracy of identifying suspect areas.

The gypsy moth appears well entrenched in southwestern New Brunswick and in western Nova Scotia. However, present populations are in most places so low that the effort required 'to chase down individual larvae' during detection surveys would tax the available resources beyond their limits. In future a different system of monitoring will likely be used.

Forest Tent Caterpillar

In Nova Scotia, forest tent caterpillars caused severe defoliation on trembling aspen over about 35 000 ha (86,487 acreas), a significant increase from 1982. Most of the damage occurred in Annapolis, Kings and northern Hants counties. Defoliation in 1983 is estimated to have affected about 10 per cent of the province's poplar inventory.

Pathogens

Sirococcus shoot blight

The disease is widely distributed in red pine plantations in Nova Scotia. The damage potential of the disease, indicated by observations reported in 1982, prompted a special assessment survey of plantations and natural stands of red pine in 1983.

In mainland Nova Scotia the hardest hit area and all affected areas in 1983 were found west of the Colchester-Pictou and Halifax-Guysborough county lines, although the disease is known to occur throughout the province, including Cape Breton Island. Ornamental trees and hedgerows were affected in several areas and the disease was present in one young Hants County plantation. This disease has also caused red pine mortality in some nursery seedbeds.

Dutch Elm Disease

This pathogen has continued to spread into new areas and to intensify within the known range in 1983. In Nova Scotia, although the spread was not great, diseased trees were found for the first time outside the known range at Annapolis Royal, Canning, and Dartmouth. Within the known range there was a significant increase in the number of diseased trees in some areas where intensification is being studied. Near Newport, Hants County, where 11 per cent of the trees became infected between 1980 and 1982, there was an increase of 43.3 per cent in the number of new infections in 1983. Whereas nine per cent of the trees became diseased in 1982, 4.3 per cent of the remaining healthy trees were infected in 1983. This sudden increase followed the same pattern found previously in other areas of the Maritimes. It indicated that after this initial 'jump' in incidence most of the remaining elm trees are likely to become infected within a few years.

FOLIAGE PROTECTION PROGRAMS

Foliage protection programs were undertaken against the gypsy moth and spruce budworm.

Gypsy Moth

The department acted as a resource agency for the Town of Yarmouth for the suppression of gypsy moth within the town limits. A three-measures plan was implemented: (1) egg-mass destruction during the previous fall

and spring; (2) two ground applications of *Thuricide* 32LV at 20 BIU per ha during the second and third week of May; and (3) high densities of male pheromone traps to exhaust the local male populations. The results of these and earlier efforts was that only six males were trapped in 865 pheromone traps in the fall, and that no new egg-masses were noted in the fall of 1983. This means that the gypsy moth population is very low in Yarmouth and that they will be difficult to find within the town in 1984.

Spruce Budworm

The spruce budworm continues to persist in mainland Nova Scotia. Blomidon, Sand River and Chignecto, which consist of 26 459 ha (65,382 acres), were added to the 1983 Btk spray program. Cone production areas and one silviculturally enhanced area in Cape Breton [496 ha (1,226 acres)] were also included in the program.

Aircraft

One Hughes 500 helicopter was used to spray the Cape Breton treatment areas, whereas nine Grumman Ag-Cats were used to spray the Mainland treatment areas. Five Cessna 172 aircraft were used as guidance aircraft.

Biocide

Three commercial preparations, (*Thuricide* 32LV, *Dipel* 88 and *Novabac* 3) and one experimental formulation (*Futura*) were applied at 20 BIU per ha. The total area flown in Nova Scotia was 20 726.5 ha (51,216 acres). Of this, 20 239.7 ha (50,013 acres) were on the mainland and the remaining 486.8 ha (1,203 acres) were in Cape Breton.

Weather

The spring was cool and wet, which impeded larval development and enhanced tree development. The hot dry weather during the latter part of June reversed larval and host developments. However, the weather appears to have significantly stressed spruce budworm populations throughout the province.

Reduction in Survival

The reduction in survival varied with host and population density. On balsam fir there was no significant reduction in survival at higher popula-

tion densities, but there was a 92 per cent reduction at lower densities. A similar result was obtained with *Thuricide* 32LV.

On red spruce the reduction in survival varied from 22 per cent in Chignecto to 93 per cent in Eatonville. Generally the higher values of reduction in survival occurred with lower population densities.

Foliage Protection

Relative foliage protection for balsam fir varied from 22 to 39 per cent, and on white spruce from 14 to 54 per cent. Relative foliage protection for red spruce ranged from 0 to 62. There does not seem to be a difference in foliage protection with use of different commercial formulations.

Expenditures

Total expenditures of the Btk program from 1 October, 1982 to 30 September, 1983 was $730,038.20. The cost per hectare flown was $35.22. There were 53 surplus drums of Btk from previous years. The value of this material was $52,325.99. The adjusted value for the Btk used was $130,572.67 which is equivalent to $6.30 per hectare flown (See Table VII, Appendix).

SILVICULTURE TRAINING

Silviculture Courses

The first of what will be a continual in-service training program for Lands & Forests and private sector staff in various silviculture treatments began with a course in Shelterwood Harvesting. Approximately 200 foresters, technicians, silviculture contractors and workers attended the two-day courses held in various locations throughout the province. Future refresher courses are being developed for personnel making silvicultural prescriptions. Each course is developed around keys — condensed guidelines prepared by the Reforestation and Silviculture Division — and enables field staff to determine the best treatment for a particular forest stand or condition.

Woodlot Management Courses

During the fall semester, 14 students successfully completed the Farm Woodlot Management course (previously open to technical students) at the Nova Scotia Agricultural College (NSAC). 1983 marked the first time those seeking a degree in agriculture could enroll in this course. The course is designed to acquaint students with the farm woodlot resource and how to better manage it.

A week-long course was given in Truro to assist seven farm woodlot owners in proper management practices and in the maintenance and safe use of chainsaws. Subdivision personnel also participated in a Basic Christmas Tree Producers Course in New Germany.

Training Aids

Many visual aids, including overhead transparencies, 35 mm slides, and colored, laminated flip charts, were produced for use in training programs. Instructional aids and equipment were supplied to the department's chainsaw instructors now routinely carrying out training programs in their subdivisions. Eight forest safety and technical checklists were printed and distributed to operational staff and silviculture contractors for use in determining the need for further training.

Other

As part of the department's submission to the Royal Commission on Forestry a presentation was made on the need for specialized training of the professional forest worker. A presentation was made on Nova Scotian silviculture training activities and approaches, at the annual meetings of the Association of Woodland Trainers held in Ludlow, N.B.

Subdivision personnel represented the department on the Safety and Training Committee of the Nova Scotia Forest Products Association. Through the efforts of this committee a three-week 'Train the Trainer' course was conducted at the Commercial Safety College in Masstown. Nine instructors were graduated.

FOREST RESEARCH

Nursery Research

Experimentation with moisture and nutrient regimes, pest control products, cultural techniques, storage, lifting and shipping practices, provides information needed for improving the quality of seedlings produced in forest nurseries. Current projects include: (i) control of seedbed density in relation to stick quality and frost-heaving resistance; (ii) development of soil moisture curves for accurate application of irrigation water; (iii) propagation of black spruce by cuttings; (iv) replacement fertilization of container-grown seedlings.

In addition, a one-hectare (three-acre) hybrid poplar plantation of seven clones was established at the Lawrencetown nursery. The plantation will provide information in growth and yield of hybrid poplar in Nova Scotia and on the cultural practices required for their successful establishment.

Christmas Tree Research

The Research Section, in collaboration with the Christmas Tree Council of Nova Scotia, initiated programs designed to determine the type and level of management required for the production of premium trees. In addition to the initial Christmas tree experiment located on a naturally regenerated site at Loganville, Pictou County, a second area was selected and planted at Greenfield, Colchester County. The latter trial will evaluate the performance of various balsam fir stock types for outplanting. Both trials are designed to determine the effect of various types of fertilizers, growth regulators and shearing schedules on shoot and bud development, needle length and foliage color and density.

Hardwood Research

In anticipation of the increasing importance of hardwoods and in recognition of the limited information available on the growth and yield of hardwoods in Nova Scotia, the department established, under the previous Subsidiary Agreement for Forestry, an intensive hardwood growth and yield study. With provincial inventory data, this study will provide the basis for rationalizing hardwood management alternatives and predicting the effect of spacing on regeneration.

The fifth-year remeasurement of the 265 permanent sample plots established in over 30 different stands was completed, and computer analysis of the data initiated.

Additional work this year included the establishment of two cleaning trials in sugar maple stands. As well, 1,300 sample plots were used to assess hardwood regeneration under various management options including shelterwood cuts, clearcuts, strip cuts and selection cuts.

Softwood Research

Detailed prescriptions and guidelines in the form of silvicultural keys were developed during 1983. They are being used by both the private sector and government. Since decisions regarding the choice between silvicultural treatments is based on specific site and stand characteristics, the keys apply to a wide variety of forest conditions. Development of the keys was based largely on repeated remeasurement of hundreds of permanent sample plots established by the research section in experimental plantations, cleaned stands, thinned stands, natural unmanaged stands, areas treated with various rates and types of herbicides, natural regeneration, etc.

A field handbook combining the keys with graphs and tables for estimating present and future stand characteristics is scheduled for publication soon. These keys and guidelines will provide up-to-date information to field staff charged with the efficient expenditure of silvicultural funds.

Biophysical Land Classification

One of the many positive spin-offs of the Canada Land Inventory was the recognition of the need for a biophysical classification of the province, and the production of maps covering the entire province. The classification is designed to permit the refinement or development of ecologically sound land use and management plans and policies. The largest unit of classification is called the Land Region. It is subdivided into progressively smaller units called Land Districts and Land Systems. These units provide a realistic basis for summarizing the wealth of resource data available. Such a summary is useful for the development of resource plans and/or policies.

Allowable Annual Cut Model

Over the past two years, research staff have been involved in the development of a considerably refined allowable annual cut model, called

Strategic Analysis Wood Supply Model (SAWS). The model permits the department to rapidly determine the effects of various management alternatives, disasters, etc. on the immediate and long-term supply of wood.

Publications

Articles published recently by the Research Section include:

Seedbed density influences diameter and dry weight 2 + 0 spruce seedlings, Forest Research Note No. 7, P. D. Neily

Plantation performance on the Trafalgar Burn, Forest Technical Note No. 3, R.E. Bailey & R.D. McNally

Vegetative propagation of highland black spruce, Forest Technical Note No. 7, D.M. Levy

Cone crop and collection 1983, Forest Technical Note No. 21, P.D. Neily

Status Report on the Management of Jack Pine in the Provinces of New Brunswick and Nova Scotia, M.K. Barteaux & R.E. Bailey

FOREST RESOURCES PLANNING AND MENSURATION DIVISION

FOREST INVENTORY

General

Because forests are a living resource, sound forest management requires constantly updated data on all lands, regardless of tenure. A recurring or cyclic inventory of the province's woodlands commenced in 1964, using aerial photography, photo interpretation, cruising, compilation and reports. By 1971 the second cycle began. All data are stored on maps and computer discs, and reporting is on a 10-year basis so that no data are more than a decade old.

To provide current data on forest growth and yield, a province-wide system of 1,765 permanent sample plots [each 0.040 4 ha (0.1 acres)] is also employed. These are measured every five years. The first remeasurement in 1965 plots commenced in 1970, the second in 1975.

Aerial Photography

Aerial Photography is contracted to Atlantic Canada Remote Sensing of Maritime Resource Management Services (MRMS) a year before the field work begins. During the spring and summer of 1983 aerial photographs were taked of Cape Breton and Richmond counties using true-color film. From these were produced prints for photo interpretation, scale 1:10 000.

Field Work

From April to September a crew of 12 men established 2,000 sample plots in over 400 stands in Halifax County for estimation of forest volumes and collection of data on wildlife habitat. From September to December a crew of 14 men remeasured 400 permanent sample plots across the province. This represents 66 per cent of the fourth measurement on these plots for determination of growth and mortality.

Compilation and Report

Results of the Eastern Subdivision inventory have been published in an Information Report. A Technical Note on Hants County data has been distributed. The field data for Halifax West have been compiled and will be reported upon completion of Halifax East field work and compilation.

FOREST PRODUCTION

Total commercial forest production for the 1983 calendar year decreased by 20 per cent from 1982. Softwood lumber increased by 19 per cent; hardwood lumber decreased by 21 per cent. Overall lumber production increased by 17 per cent from 1982. Pulpwood export from Nova Scotia in 1983 decreased by 15 per cent from 1982; i.e., from 169 136 m^3 [stacked] (46,664 cords) in 1982 to 143 171 m^3 [stacked] (30,500 cords) in 1983.

Of the 2 192 316 m^3 (77,420,982 cu.ft.) of primary wood production, 41.5 per cent was acquired by sawmills, and 58.5 per cent went to roundwood users. Of the 911 963 m^3 (32,205,699 cu.ft.) of primary production processed by sawmills, 277 708 m^3 (9,807,174 cu.ft.) went to pulp mills as chips from sawmill residue. Compared to 1982, increases were reported for mine packs, staves and headings, pit props and softwood lumber. Decreases occurred in hardwood lumber, boxwood, railroad ties, laths, shingles, residue chips, poles and pilings, and pulpwood (See Table 1, Appendix). Industrial shutdowns accounted for the pulpwood decreases.

In 1983 provincial Crown lands produced 16 per cent of primary commercial production (See Tables II to IV, Appendix); large private ownership accounted for 45 per cent and small private ownership for 39 per cent.

LAND EVALUATION

There were 28 separate lots of land evaluated for purchase or trade by the Crown for a total area of 2 150 ha (5,311 acres) (See Tables XV and XVI, Appendix).

SCALING

Monthly check scales were carried out at Nova Scotia Forest Industries.

The department and Scott Maritimes Ltd. jointly carried out a monthly scaling project to monitor conversion factors between weight and volume. This was necessary because stumpage dues are based on volume, whereas wood cut from Crown lands under the agreement with this Company is weighed.

In cooperation with district staff, check scales were carried out on wood cut under agreement with several sawmilling firms who hold cutting agreements on Crown Lands.

A recommended procedure for scaling truckloads of stacked wood was developed in consultation with producers and users of wood. Nova Scotia Forest Industries has adopted most of these recommended procedures into its scaling instructions and specifications.

Assistance was given to various subdivisions in resolving scaling problems and complaints. Several of the problems related to the measurement of whole tree chips now being used to generate electricity.

The annual Timber Scalers School was held at the Agricultural College in Truro during October 17-21, 1983 with 20 candidates in attendance.

The Scalers Act has been revised and has passed second reading in the Legislature. This revised Act gives us authority to prepare a Scaling Manual prescribing the methods of measuring primary wood products offered for sale or purchased in the province.

The CSA Committee on Scaling Primary Forest Products (of which the Supervisor of Scaling is a member) prepared and submitted a brief to

the Department of Consumer and Corporate Affairs. This brief recommended that the definition of the cord be revised and the unit stacked cubic metre be approved by the Weights and Measures Division of that department. It appears that our recommendations were approved.

The former legal definition of a cord states that "... the cord shall contain 128 cubic feet." This definition has been upheld in courts. All the provinces define a cord as occupying 128 cubic feet. This difference in interpretation was of concern to provincial forestry departments and the forest industry and we are relieved to see this problem satisfactorily resolved.

Alton Sutherland has been appointed to a secondment position to the Supervisor of Scaling.

The Supervisor of Scaling, in co-operation with the Maritime Lumber Bureau, arranged two-day lumber grading courses in the eight subdivisions of the province. One additional course was held for the Planning Section. One hundred and fifty-four department employees attended these basic courses.

FOREST MANAGEMENT PLANNING

Subdivision Plan

A third draft of the 20-year subdivision plan for the North Central Subdivision was completed during fiscal 1983. The format of this plan is expected to be used for preparing similar plans for the other subdivisions.

At the request of various users in the Operations as well as Planning branches of the department, the division's management information system was used for a wide range of information searches.

The Forest Management Planning Section assessed and monitored annual operating plans and proposals for silviculture and road construction activities in the eight subdivisions of the province.

Remote Sensing

The department has acquired satellite imagery for 70 per cent of the province. This digital imagery is being used to detect and record forest clearcuts and access road construction for specific areas. Computer-driven

digital image analysis systems located at the Nova Scotia Land Survey Institute and at MRMS are used to analyse the satellite data.

The Forest Resource Planning and Mensuration Division has investigated the department's requirements for geographic information systems technology and has recommended the use of such technology for management purposes.

Access Road Engineering

During fiscal 1983 the Forest Engineering group was responsible for preparing 11 tender packages involving 70.4 km (42.2 miles) of road construction. In addition, 12 km (7.5 miles) of road were built using department-owned machinery. On all these jobs the Forest Engineering group was responsible for the survey work, including all hydrology studies and monitoring.

During fiscal 1983 48 km (30 miles) of roadside were seeded, along with 12 parks and recreation sites (4 ha [10 acres]) and one rifle range.

TIMBER LOAN BOARD

The work of the Supervisor of the Timber Loan Board entails the location, field examination and investigation of physical plants and businesses, and the preparation and presentation of reports to the board.

Four applications were received this year from three different firms, for five separate parcels of land containing approximately 399 ha (985 acres). The board accepted three of these applications and processed three loans during the period.

The Timber Loan Board's Chief Technician coordinated the processing of applications for loans, annual inspections, investigations and reports required in connection with these accounts.

WILDLIFE DIVISION

NON-GAME

Major non-game projects and activities in the past year have concentrated on species such as hawks, eagles, owls and cormorants, protected by Pro-

vincial statutes. Their food habits and habitats in relation to human resource development and use are also of concern.

Among projects completed or continued in 1982-83 was a study of the numbers, productivity, wintering areas and food habits of breeding bald eagles. Having a relatively stable and productive population of 125 to 150 breeding pairs, the province agreed to donate four nestling eagles to the United States. This was done as part of a long-term cooperative program to assist that country in re-establishing breeding bald eagle populations in the Northeast.

Also completed in 1983-84 was a census of great- and double-crested cormorants, which indicated a substantial increase to an estimated minimum of 2,000 and 12,000 pairs respectively. Additional food habit studies of these species in relation to commercial and game fish have been extended. Island seabird inventories and island ecological surveys were continued. So was the cooperative program with the Forest Inventory Section to measure wildlife habitat characteristics.

The use by osprey of substitute nest platforms placed next to power line poles was again monitored. Additional substitute sites elsewhere were also successful in maintaining local breeding populations of these birds.

Many requests were answered for assistance in dealing with nuisance non-game animals, and several minor nuisance animal complaints were investigated. General information on non-game animals was made available as requested by the public. Presentations on non-game species, their habitats, and wildlife-habitat planning were made to various public groups and committees.

BIG GAME

Deer

Over 90,000 persons were licensed to hunt deer and bear in Nova Scotia during the open season October 28 - December 3. (License sales by type and county are listed in Table VIII, Appendix.)

Big game report card returns indicated a hunter success of 49.2 per cent among residents and 56.3 per cent among non-residents. This resulted in a calculated legal kill of 44,513 deer, making this the second highest white-tailed deer kill in Nova Scotia history.

The calculated legal kill by county was:

Kings	1462	Cumberland	4360	Cape Breton	1596
Annapolis	1919	Colchester	4568	Richmond	1388
Digby	1818	Pictou	2759	Inverness	2401
Yarmouth	1995	Antigonish	1115	Victoria	1076
Shelburne	1761	Guysborough	3507	Unknown	361
Queens	2050	Halifax	3631		
Lunenburg	3349	Hants	3397		

A redesigned report card in 1983 provided information on the number of people hunting with bow and arrow. It suggested that 491 hunters hunted at least once with the bow during the season. Hunter success among bowhunters was reported to be 4.7 per cent with over 110 recreation-days provided for each deer taken.

Bear

Hunter returns for 1983 suggested a black bear harvest by deer hunters of 135 bears. In addition, questionnaires from persons holding foot-snaring permits suggested that 260 bears were taken by that method. Eighteen bears were reported killed for their assumed involvement in depredations, and nine were reported killed on our highways, for a total bear kill of 422 animals. The 1983 kill, based on all reports by county, was:

Kings	34	Lunenburg	44	Halifax	26
Annapolis	45	Cumberland	8	Hants	15
Digby	109	Colchester	5	Cape Breton	9
Yarmouth	2	Pictou	15	Richmond	2
Shelburne	61	Antigonish	11	Inverness	3
Queens	33	Guysborough	0	Victoria	0

Moose

The moose population in the Cobequid range seems to remain relatively low — though with some signs of improving. The 1983 pellet group inventory did not suggest significant overall change in population. The hunting season remained closed for 1983.

FURBEARERS

Furbearer license sales reached a peak of 5,521 licenses in 1981-82 and declined about 15 per cent in each of the past two years to the current level

of 3,929 licenses. The smaller number of trappers and furbearers and the reduced fur prices resulted in a substantial reduction in harvest — and consequently its value — in 1982-83. The further reduction in number of trappers in 1983-84 continued the trend, but not so drastically. In 1983-84 fur prices started low, but improved considerably in February, resulting in slightly higher prices for important species. Total fur value therefore declined only from $712,794 to $663,923 in 1983-84.

Our heavily harvested bobcat populations seemed to have reached their lowest ebb at 1,041 — down 123 from last year's harvest. Some areas report that bobcats are recovering slightly.

As predicted, our coyote harvest doubled, from 72 to 157, and will probably double annually for a few more years. To help sheep farmers control coyote damage and to teach trappers how best to catch coyotes, a coyote damage control program has been implemented.

The increased accidental catch of fisher is interpreted as a good sign that they are not being excessively harvested. (For fur export statistics, see Tables IX and X, Appendix.)

SMALL GAME

Small game license sales increased from 29,769 to 31,221 in 1983-84. Some 9,000 additional small game licenses were issued to senior citizens during each of the last three years.

The harvest of snowshoe hare took an unexplained drop, from 547,566 to 308,124. Number of rabbit hunters and harvest per hunter also declined.

Number of grouse and woodcock hunters, as well as harvest and kill per hunter held quite steady (see Tables XI to XIII, Appendix).

Pheasant populations were the highest in seven years. Pheasant hunters increased from 5,028 to 6,593 and hunter harvest increased from 10,126 to 14,171. Kill per hunter increased from 2.0 to 2.2.

The Hungarian partridge harvest decreased from 1,548 to 1,083. Populations seem to be at a low ebb.

The survey showed marked increases in all categories of waterfowl, in number of hunters, total harvests and harvest per hunter. In fact, the total

reported waterfowl harvest was the highest in many years (see aforementioned tables for details).

No change was noted in the relatively low but stable populations of Arctic hare and ptarmigan introduced to Scatarie Island in 1969.

Woodcock

Woodcock singing ground surveys conducted by department personnel in 1983 indicated an increase in breeding population. Woodcock harvests have declined for three successive hunting seasons: 1980 - 8,780; 1981 -6,143; and 1982 - 3,259. With increased numbers of woodcock on the breeding grounds in 1983-84, the harvest should increase.

Waterfowl

No estimation of waterfowl breeding population trends was made in the spring of 1983, but the Halifax-to-Jeddore Coastal Unit was flown by the department in the winter of 1983-84. The wintering population in that area showed a small increase compared to the average. In 1983, the smallest number of Nova Scotia waterfowl hunters in 10 years harvested fewer waterfowl than in the 1981-82 season.

During the year 304 black ducks, 114 eider, two widgeon, and 45 Canada geese were banded.

Wetland Inventory

Freshwater wetland inventory data were updated and a wetland reconnaissance of all the best wetlands in Halifax and Hants counties was conducted.

Revisions to and preparations for a second edition of "Important Freshwater Wetlands and Coastal Habitats of Nova Scotia" map book were made.

Lake Fertilization

The success of the Black Duck Lake fertilization study, and re-evaluation of the potential for the use of fertilization as a management tool, have stimulated a smaller but more intensive management investigation.

Wetland Habitat Modeling

Using detailed wetlands reconnaissance data and brood data, wetlands were evaluated as brood rearing habitat. Factors found to be significant were (1) area of visible vegetation as seen on 1:10 000 aerial photographs, (2) total phosphorus in water (degree of eutrophication), and (3) water level stability.

INLAND FISHERIES

Stocking

In all, 47,927 yearling speckled trout and 7,038 yearling rainbow trout were reared and distributed from the Kelly Lake Fish Culture Station in 1983 (see Table XIV, Appendix). These "put and take" fish are part of the overall provincial stocking program. The speckled trout were stocked as 22 cm (nine-inch) yearlings in lakes readily accessible to the public. The rainbows were slightly larger and part of a "put, grow and take" fishery.

Lake Surveys

Fifty-eight lake surveys were completed in 1983 as part of our continuing inventory program. This brings our total of completed surveys to 734.

pH Conditions

As part of the 1983 lake survey program, extensive chemical tests were conducted on surveyed lakes to determined pH levels and future susceptibility to acid rain. This was done in cooperation with the Nova Scotia Departmen of the Environment.

Trout Populations

A monitoring of baseline populations of wild trout as related to habitat type was conducted by electroseining, principally in Kings and Cape Breton counties.

Creel Census

A creel census of stream fishermen in Kings County ws conducted in the spring. In addition, our annual Kelly Lake creel census and the general license report card census were conducted.

Public Participation (Stream Inventory and Habitat Improvement)

The Kings County Wildlife Association was approached and encouraged to apply for a NEED project to inventory streams and build in-stream habitat improvement devices under the supervision of the Wildlife Division. This was successfully completed with over 100 km (62.5 miles) of stream inventoried and an experimental habitat improvement area constructed.

Salmon License

A new salmon tag license system was instituted in 1983 with 7,598 licenses sold. The mandatory report card returns are being analyzed in cooperation with the Department of Fisheries and Oceans. Excellent stream-specific biological data is being provided.

Salmon Survey

A socio-economic mail survey of salmon anglers is being conducted in cooperation with the Department of Fisheries and Oceans. The ultimate goal is to produce firm documentation of the value of recreational salmon fishing.

Calculated Catch

The calculated catch of speckled trout by licensed anglers in 1983 was 1,637,841 or 19.3 per licensee.

WILDLIFE AREAS

Provincial Wildlife Parks

The Provincial Wildlife Park at Shubenacadie enjoyed another successful year. As in former years, we opened on May 15 and closed on October 15. The Creighton Forest Environment Centre opened June 1 and closed September 1 with a lot of interest being shown in the displays.

Estimated attendance for the year was 325,000, which was up from the previous year.

Canada goose eggs were again obtained from Ontario, and although the number of eggs obtained was down, 45 young were hatched and releas-

ed into various habitats on Cape Breton Island. The success of this project is being evaluated.

During the year 429 wood ducks were hatched, reared and released in cooperation with Ducks Unlimited. This project has also been successful over the years and appears to have wide public support.

Upper Clements Wildlife Park has continued to attract around 100,000 people during the season and is continually being upgraded with new ponds and walkways.

Two Rivers Wildlife Park has been stocked with animals and has enjoyed a fair number of visitors during the first full season in operation. Most enclosures including the bear pen have been completed.

Wildlife Management Areas

The following areas were managed by the department:

	Predominant Species	County
Antigonish Harbour	waterfowl	Antigonish
Debert	waterfowl	Colchester
Eastern Shore Island	seabirds	Guysborough-Halifax
Kelly Lake	salmonids	Halifax
Pearl Island	seabirds	Lunenburg
Scatarie Island	ptarmigan, Arctic hare	Cape Breton
Tobeatic	beaver	(Digby, Yarmouth, Shelburne, Queens)
Minas Basin	Canada goose	Kings
Dewey Creek	waterfowl	Kings

At Manganese Mines in Colchester County the department manages an outdoor education area.

Provincial Sanctuaries

Debert—Colchester County
Chignecto—Cumberland County
Shubenacadie—Colchester County
Waverley—Halifax County
Sunnybrae—Pictou County
Blanford—Lunenburg County
Melbourne Lake—Yarmouth County
Martinique Beach—Halifax County
Upper Clements—Annapolis County
Liscomb—Halifax & Guysborough counties

Spectacle Island—Victoria County
Two Rivers—Cape Breton County

PARKS AND RECREATION DIVISION

The provincial parks program continued to play a significant role in the social and economic development of the province. Through provision of a variety of outdoor recreational facilities, a well-distributed system of parks provided Nova Scotians with the opportunity for enjoyable and valued experience.

Tourism as well relies on the availability of public parks which protect and provide access to resource land, and which contain high quality facilities for outdoor recreation and heritage appreciation. Provincial parks play an important role in maintaining the image of Nova Scotia as an attractive tourist destination, which in turn improves opportunity for growth in the industry.

ORGANIZATION

The provincial park system is administered by the Parks and Recreation Division in Debert, and by the Operations Branch from its eight subdivisions and 21 district offices throughout the province. The Parks and Recreation Division is responsible for planning the park system and its individual parks, as well as for preparation of standards and procedures for development and operation. The Operations Branch is responsible for park maintenance, operation, and policing; and, under guidance from Parks Division staff, does most capital construction. The capital budget is administered by the division, which also manages large construction projects.

THE PARK SYSTEM

In 1983, 19 campgrounds and 78 beach and picnic parks were provided for the public. Additional picnic facilities were available at the Shubenacadie Wildlife Park, the Two Rivers Wildlife Park and at Balmoral Grist Mill. Total operational parkland equalled 6 819 ha (16,849 acres) with an additional 10 106 ha (24,970 acres) held in reserve for future expansion.

During 1983-84, properties totalling 105.9 ha (261.8 acres) were acquired. Of this total, 47.75 ha (118 acres) were acquired at Lawrencetown and 46.5 ha (115 acres) were acquired at Lake Charlotte. Both sites are

located in Halifax County. Other acquisitions include 1.3 ha (3.14 acres) at the Caribou Ferry Terminal in Pictou County.

Provincial camping parks opened on May 20, and remained open until October 11 (Thanksgiving Day). Camping fees were set at $6.00 per night, and firewood was sold for $1.00 per bundle. Day-use facilities were available to the public at no charge. Total revenue from camping permits was $252,648.

Park Use

A summary of 1983-84 campground user statistics shows that the park system's 1,457 individual campsites accommodated an estimated 142,000 persons for 48,000 party nights. These figures are down slightly from previous years.

Visitors from other provinces and the United States slightly outnumbered local visitors. The average number of campers per permit was 2.95 (estimated) and the average length of stay for these people was 1.67 (estimated) nights.

Project Planning and Development

The total divisional budget for planning, development and administration was $949,500. This funding resulted in planning and development being carried out in 32 park sites. This required planning inputs which ranged from site assessments through development of management concepts to preparation of detailed site development plans.

Examples of these projects include:

Parks	County	Development
Pomquet	Antigonish	Road and parking lot development
Melmerby Beach	Pictou	Re-surfacing park road
Tor Bay Atlantic	Guysborough	Constructing day-use park, with wheelchair access (Funded under Tourism sub-agreement)
Ellenwood Lake	Yarmouth	Landscaping of new campground sites
Dominion Beach	Cape Breton	Restoration of dune system and roadways

Major Park Planning Projects in Near-Urban Areas

In 1975 the Halifax Regional Development Plan designated seven regional parks to ensure protection of and provide public access to exceptional natural resources. In 1983, four of these parks were assigned to the Department of Lands and Forests for acquisition, development and operation. These properties include the following: Long Lake (Halifax Watershed Lands), Cole Harbour/Lawrencetown, McNab's Island and Canal Lakes.

Several park planning projects have been initiated in these regional parks. Planning was initiated for a major day-use area at Long Lake which would provide facilities for freshwater beach swimming, family picnicking, hiking and outdoor education. At 2 074 ha (5,125 acres), Long Lake Provincial Park is the largest provincial park in Nova Scotia, and will provide a wide range of high-quality outdoor recreational opportunities in a near-urban environment.

Another major planning project was the preparation of a park plan for Cole Harbour/Lawrencetown Provincial Park. This 607 ha (1,500-acre) provincial park is situated on the eastern edge of Dartmouth and offers significant coastal landscape features. These features, when combined with the cultural history of the area, provide an unequalled provincial park opportunity in a near-urban setting.

The division also provided planning input on the development of the Lake MicMac-Lake Charles section of the Shubenacadie Canal. This project was initiated through a joint funding arrangement between the province and the Federal Special Capital Recovery Program.

A major planning project also was initiated at Dollar Lake Provincial Park. This planning initiative included the planning of a new access road, major improvements to the main beach area, central parking facilities and nature trails so that the park's tremendous natural resources may be more fully utilized.

At Petersfield Provincial Park Reserve near Sydney, the Parks and Recreation Division prepared plans for the development of a 23 ha (56-acre) historic estate property. This development will provide public access to high-quality, managed open spaces, serving the major population base in industrial Cape Breton.

Facilities for Handicapped Persons

The Parks and Recreation Division has continued an ongoing program to provide improved access and increased facilities for handicapped persons. After an evaluation of several sites in the Halifax Metropolitan area, Lewis Lake Provincial Park was selected for the establishment of facilities which would enable handicapped persons to participate in fishing. Planning and design work were initiated.

Beach and Shoreline Restoration

Preservation of beach and shoreline within provincial parks is an ongoing concern. Dune restoration and stabilization work was undertaken at Melmerby Beach (Pictou County), Sand Hills Beach (Shelburne County), Martinique Beach (Halifax County), and Dominion Beach (Cape Breton County).

NATURAL HISTORY RESOURCES

Work has continued on the report entitled *Natural History of Nova Scotia.* Written in conjunction with the Nova Scotia Museum, the report provides an important source of information on the natural history of Nova Scotia. It will be utilized by the Parks and Recreation Division in preserving and interpreting the natural history resources of Nova Scotia. Published in draft format in 1983, the two volume report was distributed to a wide range of specialists and potential users for comment. Final publication is expected in fiscal 1984-85.

INTERPRETATION, BROCHURES AND PARK USE INFORMATION

Efforts to expand interpretation within provincial parks were continued in 1983-84. Interpretive displays were developed for Tor Bay Atlantic Provincial Park emphasizing its dune system, coastal shoreline and flora and fauna. Erection of the displays is planned for 1984-85.

An attractive brochure was developed and printed for Chebogue Meadows Interpretive Trail. The brochure provides information on wildlife habitats of interior southwestern Nova Scotia and identifies examples of habitats found along the interpretive trail.

To encourage greater usage of hiking trails operated by the Parks and Recreation Division, the division provided the Canadian Youth Hostelling

Association with information on seven hiking trails for inclusion in their widely read publication *Hiking Trails of Nova Scotia.* This information includes location maps and texts which highlight the outstanding features of each trail.

Information on the provincial park system at large was distributed through the Department of Tourism's *Nova Scotia Treasure Guide.*

LAND SERVICES BRANCH

424-5481

The Land Services Branch consists of the following: the Land Acquisition and Registry Division, the Surveys Division, and the Provincial Crown Lands Record Centre.

Land Acquisition and Registry Division. The Land Acquisition and Registry Division (424-4267) is responsible for the acquisition and disposal of Crown lands administered by the Department of Lands and Forests and acts on behalf of other departments and agencies in the acquisition and disposal of land. The division prepares all legal documentation related to deeds, leases, grants, licenses, certificates, and letters of authority.

Necessary legal and other documentation for the Beaches Preservation and Protection Act, Land Titles Clarification Act, Land Holding Disclosure Act, and Parks Development Act are prepared by the division. A large number of expropriations are carried out in co-operation with the expropriating authority.

All quieting of titles actions are referred to the division prior to court proceedings to determine if the Department of Lands and Forests has an interest in the action.

The Registry Section of the division acts as custodian for all Crown land records dating back to 1730. Thousands of inquiries from the public related to land title problems are handled annually.

The division is responsible for the investigation and settlement of claims to ungranted land.

Surveys Division. The primary objective of the Surveys Division (424-5020) is to survey, monument, and map the Crown lands administered by the department and to maintain surveyed Crown land boundaries. In addition, it has the following secondary objectives: to survey lands for purchase or expropriation; to provide a drafting and mapping service in support of departmental programs; to survey lands which the department wishes to protect for environmental, recreational, or cultural purposes; to provide a surveying service to other government departments or agencies; and to acquire aerial photography.

Provincial Crown Lands Record Centre. The Provincial Crown Lands Record Centre, 45 Alderney Drive, Queen Square, Dartmouth (424-8680) co-ordinates and consolidates information related to all provincial land holdings for all government departments and agencies (including boards, corporations, and commissions). It updates the Crown Lands Record and Resource Series Maps; microfilms and stores related deeds, leases and rights-of-way; and provides statistical data for departments and agencies. These data are required to coordinate acquisition and disposal of land and to develop land-use policies and plans.

On request, the Provincial Crown Lands Record Centre also provides these types of statistical data and visual-display materials to the public and to federal or municipal departments and agencies.

SURVEYS DIVISION

ADMINISTRATION

The Administration Section is made up of four persons in management and a support staff of eight. The support group is made up of secretarial services, plan examination and research groups.

Requests for surveys during this fiscal year amounted to 167, for which orders of survey were issued to the survey field staff. During the period, 144 returns of survey were received from the field, and 175 survey plans were inspected, approved, processed and filed.

Ninety-three plans and descriptions were prepared and approved pursuant to Section 30(1) of the Lands and Forests Act, for a total of 151 separate parcels of land. These form part of a Certificate of Release issued by the Crown asserting no interest or claim to the corresponding parcel of ungranted land. In addition plans were drafted for 21 leases, 11 grants, 12 legal surveys and three miscellaneous plans.

The section negotiated a contract with Atlantic Canada Airborne Sensing of Amherst for vertical color aerial photography covering the southern part of Cape Breton Island.

The Surveys Division provided inspection of condominiums plans on behalf of the Registrar of Condominiums. During the period, plans were inspected for two townhouses and five apartments consisting of 216 units.

CROWN LAND SURVEYS

The total area of Crown land surveyed during the year was 10 817 ha (26,729 acres). This required 382 km (237 miles) of boundary line, 188 km (117 miles) of trial line and 293 km (182 miles) of tie line to the Nova Scotia Control Survey and the placing of 1,018 survey monuments. To date, Crown land surveyed and monumented totals 1 386 278 ha (3,425,562 acres).

Distribution of Crown land surveyed during 1983-84 was as follows:

County	Hectares	Area in Acres
Annapolis	15	38
Antigonish	235	581
Cape Breton	599	1,480
Colchester	501	1,237
Cumberland	585	1,445
Digby	194	480
Guysborough	1,813	4,481
Halifax	743	1,837
Hants	210	540
Inverness	1,272	3,143
Pictou	10	24
Queens	2,483	6,135
Richmond	350	864
Shelburne	54	134
Victoria	1,739	4,298
Yarmouth	5	12
TOTAL	10,817	26,729

Related survey work included 11 site surveys for construction purposes, three surveys for expropriations, six lots surveyed within the Land Titles Clarification areas, subdivision of five lots in industrial parks, surveys for the Atlantic Winter Fair site, two surveys entailing beach cross sections for assessment of buildup and erosion, the setting of targets on survey monuments for control of mapping from aerial photographs, and the placing and surveying of eight new control survey monuments.

Boundary Line Maintenance

During the period, 560 km (348 miles) of boundary line were renewed by Surveys Division staff and 612 survey monuments replaced. Operations staff assisted, renewing 591 km (367 miles) of boundary and replacing 262 monuments. In total, 1 151 km (715 miles) of boundary were maintained and 874 survey monuments replaced.

SPECIAL PROJECTS SURVEYS

The Special Projects Surveys Section is responsible for surveys which generally fall outside the scope of the Crown Land Surveys program. This includes engineering surveys, and surveys for land protection, purchases and expropriations.

During the year, 31 special projects surveys were completed. They included surveys for Department of Government Services, Industrial Estates, Department of Development, as well as for the Department of Lands and Forests.

MAPPING

The Mapping Section is composed of three groups: Photogrammetry, Cartography and Reproduction.

Photogrammetry

This section consists of two photogrammetric technicians with an A-8 stereographic plotter, co-ordinograph, digitizer and computation equipment. Mapping in manuscript form was completed for three sites in the province. The areas are: Battery Park, Richmond County — 1:1 000 mapping; Smileys Park, Hants County — 1:1 000 mapping; and Walton, Hants County — 1:2 400 planimetric layout. Quality inspection of aerial photography flown for the department over Cape Breton, Richmond and the southern half of Inverness and Victoria counties was carried out during a two-month period by one photogrammetric technician.

Cartography

The cartographic group consists of three units: orthophoto mapping, special assignments and Crown land property mapping. It employs nine drafting technicians.

The Orthophoto Unit continued with a program of developing a series of forest inventory map sheets on the 1:10 000 orthophoto resource base. During the period, plotting was completed on 95 sheets in Richmond and Cape Breton counties, yielding a new project total of 1,159 map sheets plotted. Plotting and scribing of Crown land boundary has been completed for Inverness, Victoria and Richmond counties, with final drafting (scribing) of 192 mapsheets.

Additional Crown boundary survey was plotted and approximately 170 map sheets were revised in the North Central and Eastern subdivisions. Twenty-eight forest type maps were completed, finalizing work in the Eastern Subdivision. This unit has a complement of three drafting technicians.

The Special Assignment Unit produced 24 Crown land forest type maps at a scale of 1:15 840, covering a portion of Lunenburg County. It supplied 73 diazzio scribecoats of the Western Subdivision to the Forest Inventory Section for forest typing. The unit researched, tabulated and updated 220 map sheets showing Nova Scotia Pulp Limited's licensed Crown land in the seven Eastern counties. It updated 542 maps of the province showing Crown boundary lines by plotting 34 field plots and 189 revisions. Five special maps for spruce budworm assessment were completed.

Thirty-three large-scale topographic maps were produced by this unit for manuscripts prepared by the photogrammetric group: six of Caribou Provincial Park, Pictou County; 11 of Lawrencetown Beach, Halifax County; and six of Boylston Provincial Park, Guysborough County. Seventy-four other projects were undertaken and completed for various sections of the Operations and Administration divisions of the department. This unit has three drafting technicians.

The Crown Land Property Mapping Unit is responsible for identifying all lands administered and controlled by the department. The unit continued working with the Systems and Computer Division of Government Services on the development of the Crown land cadastral information system to be used in conjunction with the present 1:15 840 map series. The creation of this information system is being dealt with in five phases: 1) situation analysis; 2) pre-design; 3) detail design; 4) implementation and 5) installation. The first two phases have been completed. Phases 3 and 4 are on "hold" due to budget restraints.

Updating of the existing 1:15 840 scale map series for the province is ongoing to meet day-to-day requirements and in preparation for final stages of the information data capture and storage.

This unit also provided interpretation and subsequent revision of seven Crown Land Forestry Map Sheets in Lunenburg County at a scale of 1:15 840, which were subsequently made into 47 map book sheets for fire prevention/suppression use. This unit has three drafting technicians.

Reproduction

The Reproduction Unit consists of one darkroom technician employing a darkroom, air photo library and map reproduction facilities.

Darkroom

The darkroom, using a photomechanical contact process vacuum frame, produces film positives, negatives and papers required by the cartographic group in the revision of existing plans and for the production of large-scale and orthophoto forest type mapping

In this fiscal year, 298 requests were received which required processing of 1,192 pieces of material. Thirty-five requests from the orthophoto mapping unit required processing 441 pieces of film. Twenty-eight forest type maps at 1:10 000 scale and 24 at 1:15 840 scale were completed. One hundred and thirty-four film positives were processed for the Surveys Division and five archive plans for the Land Acquisition and Registry Division. In addition, the unit processed 99 plans of Section 30(1) Certificates and 492 other pieces of material for various sections of the department, and fourteen (14) pieces of material were processed for other government departments. Twenty-eight requests for camera services were also carried out beyond departmental resources.

Air Photo Library

The Air Photo Library is stocked with 185,000 aerial photographs which provide coverage of the province and which date from 1927. The general public are permitted only to view the photographs, but are assisted in ordering prints from the National Air Photo Library, Ottawa, or from MRMS in Amherst. This ordering service is also extended to other government departments and agencies. During the past year, staff dealt with approximately 1,800 such requests.

Map Reproduction Unit

The Map Reproduction Unit is administered by the same staff as the Air Photo Library and has on file almost all the film positives of the departmental map sheets. It also has reproducible orthophoto resource and large-scale urban map sheets provided by the Land Registration and Information Service (LRIS), Summerside, P.E.I., with approximately 20,000 map tracings.

During the fiscal year, 20 planimetric and 20 topographic urban map sheets for Town of Yarmouth (1:1 000 scale) and 55 resource series orthophoto (1:10 000 scale), both planimetric and topographic film reproducible tracings, were received from LRIS. LRIS is expected to complete resource mapping for the Western Subdivision by May 31, 1984.

Originally, the Map Reproduction Unit was created to provide a reproduction service for departmental use only. During the last 16 years, service has gradually expanded to meet the demands of other government agencies and the general public. Six thousand requests required reproducing 31,000 map sheets for departmental use and other government agencies. About 11,500 of these were sold to the general public, generating revenue of $33,000 in 1983/84. This unit has a staff of two.

LAND ACQUISITION AND REGISTRY DIVISION

LAND REGISTRY AND RESEARCH SECTION

Approximately 2,500 requests from the public, provincial and federal government departments and department staff were processed. Some 1,300 required searching Land Registry and Research records, and about 1,000 required a written reply, along with copies of old records.

The section recorded and/or posted 360 documents: 30 land purchases, 43 disposal documents, 31 confirmed Crown papers, 99 Section 30(1) certificates, three grant documents, 45 lease documents, six rejected petitions, nine certificates of title, 28 survey plans and 66 contracts and agreements.

Several index sheets were revised, 215 petition numbers were issued, and 70 miscellaneous drafting assignments were carried out. Fifteen lots were plotted on aerial photos for the Claims Section, and 59 quieting of titles files were dealt with.

Approximately 2,000 microfilm jackets containing grant document microfilm were replaced; and, 10 timber lease books, four Cape Breton grant books and 1 certificate book were microfilmed.

For location of Crown land to date, and area and extent of lands reconveyed to the Crown, see Tables XV, XVI and XVII, Appendix.

LAND ADMINISTRATION SECTION

Transfers

Administration and control of 15 parcels of Crown land were transferred to other provincial departments and to the federal government.

Grants

Seven grants were issued involving approximately 269 ha (664 acres).

Deeds

Seventeen deeds were issued involving approximately 78 ha (193 acres).

Letters of Authority

Fifty-eight letters of authority were prepared for mineral exploration, construction, and a variety of domestic purposes.

Beaches

Two areas were designated as beaches under the Beaches Preservation Protection Act.

Parks

Five areas were designated as provincial parks under the Provincial Parks Act.

Certificates — Land Titles Clarification Act

Five Certificates of Title were issued under the Land Titles Clarification Act. These certificates were issued in the communities of:

New Road Settlement	Halifax County	2
Neils Harbour	Victoria County	2
Drumhead	Guysborough County	1

Certificates — Lands and Forests Act

Ninety-one certificates were issued under Section 30(1) of the Lands and Forests Act. These certificates released the Crown's interest in approximately 7 136 ha (17,634.5 acres) of land.

Tenders

Eighty-four tenders were called during the fiscal year, including parcels for stumpage, 50 parcels of sawlogs, pulpwood, studwood and Christmas trees, and 23 special tenders. The special tenders called concerned the following parcels:

Road constructions	12
Tree planting	2
Budworm spraying	1
Hay	1
Fuelwood	1
Clover	1
Rip rap	1
Site preparation	3
Hanger site	1
TOTAL	23

Timber Licenses

Eleven timber licenses were issued for cutting Crown land stumpage.

Leases

Thirty-five leases involving approximately 45 ha (112 acres) of land were issued, as follows:

Campsites	30
Agriculture (sugar bush)	1
Hangar site	1
Shooting range	1

Girl Guides	1
Seed orchard	1

Trespasses

Ten trespasses on Crown land were reported and seven notices to remove illegal camps were issued.

PROVINCIAL CROWN LANDS RECORD CENTRE

Information and documents relating to land holdings of 20 government departments and agencies were received by the Centre. To date, title, legal and statistical information relating to 25,080 parcels of land have been processed and the location and land use of the properties plotted on 20 chain line maps and resource series maps. Where available, records of these transactions — indentures, deeds, abstracts, certificates of title — have been microfilmed and the documents stored.

Research on the Nova Scotia Agricultural College properties at Bible Hill was carried out in the past year and a report was prepared. Fifteen previously unreported deeds were uncovered. This resulted in more accurate boundary information and title documents for all presently occupied lands.

At the request of the Department of Government Services, a limited research project on the Civil Defence Building property at Waverley was completed. The title documents and survey information uncovered was compiled in a report. Another request, for title information on the Provincial Building at Halifax, resulted in six previously unreported deeds being added to our records.

OPERATIONS BRANCH

424-5826

The Operations Branch is responsible for implementing and maintaining the department's programs in forest fire control; protection of beaches, fish, and wildlife; enforcement of fish and game regulations; management of the Crown lands, including timber sales and forest improvement; administering programs of assistance to private woodland owners, including a management advisory service; constructing and operating provincial parks and other outdoor recreation areas; administering designated game sanctuaties; providing field assistance in planning, data collection, and other services in Crown land administration and resource education; and the gathering of statistics on forest resource use.

The branch functions through its senior staff located in Halifax and Shubenacadie and through eight geographical subdivisions.

The Provincial Forest Fire Control Centre, P.O. Box 130, Shubenacadie, N.S. B0N 2H0 (758-2232) is responsible for the acquisition, distribution, and maintenance of fire control equipment, the motor vehicle fleet and heavy equipment. The Fire Control Centre is also responsible for the operation and maintenance of the Integrated Mobile Radio System servicing user departments and agencies of government, hospitals an ambulances, fire departments, and the RCMP.

The province is divided into eight roughly equal geographical subdivisions, each staffed with a resource manager, a Crown lands forester, a private lands forester, and in most cases a biologist. Within the subdivisions are districts headed by supervisors and staffed by forest technicians, field clerks, maintenance personnel, and forestry crews. This staff implements the Operations Branch programs.

OPERATIONS FIELD OFFICES

WESTERN
(Yarmouth, Digby, Shelburne counties)

10 Starr's Road
Yarmouth, N.S.
B5A 2T1
(742-4196)

P.O. Box 369
Shelburne, N.S.
B0T 1W0
(875-2501)

P.O. Box 367
Digby, N.S.
B0V 1A0
(245-2164)

Kemptville Depot
Kemptville, N.S.
B0W 1Y0
(761-2227)

SOUTH SHORE
(Queens, Lunenburg counties)

99 High Street
Provincial Building
Bridgewater, N.S.
B4V 1V8
(543-8167)

McGowan Lake Depot
Caledonia, N.S.
(242-2550)

P.O. Box 190
Milton, N.S.
B0T 1P0
(364-3462)

Wiles Lake Depot
Bridgewater, N.S.
(543-2394)

Chester Grant Depot
Chester, N.S.
(275-3574)

VALLEY
(Annapolis, Kings counties)

120 Exhibition Street
Provincial Building
Kentville, N.S.
B4N 4E5
(678-8907)

P.O. Box 130
Lawrencetown, N.S.
B0S 1M0
(584-2229)

SOUTH CENTRAL
(Halifax, Hants counties)

Box 23, Site 2
RR#1 Waverley, N.S.
B0N 2S0
(861-2560)

Musquodoboit Harbour, N.S.
B0J 2L0
(889-2332)

Middle Musquodoboit, N.S.
B0N 1X0
(384-2290)

P.O. Box 130
Shubenacadie, N.S.
(758-3437)

Stanley Hangar
RR#1 Scotch Village, N.S.
B0N 2G0
(372-2410)

P.O. Box 190
Windsor, N.S.
B0N 2T0
(798-2016)

Lewis Lake Depot
RR#3 Armdale, N.S.
B3L 4J3
(876-2308)

NORTH CENTRAL
(Cumberland, Colchester counties)

626 College Road
Bible Hill, N.S.
B2N 2R2
(895-6325)

P.O. Box 130
Oxford, N.S.
B0M 1P0
(447-2115)

P.O. Box 428
Parrsboro, N.S.
B0M 1S0
(254-3241)

EASTERN
(Pictou, Guysborough, Antigonish counties)

11 James Street
Provincial Building
Antigonish, N.S.
B2G 1R6
(863-4513)

P.O. Box 50
Guysborough, N.S.
B0H 1N0
(533-3503)

RR#2 Aspen
Guysborough Co., N.S.
B0H 1E0
(522-2024)

603 Maritime Building
New Glasgow, N.S.
B2H 2P9
(752-3181)

Antigonish Depot
(863-1502)

MacLellan's Brook Depot
(752-5247)

North Riverside Depot
Guysborough, N.S.
(533-3333)

CAPE BRETON NORTH
(Inverness, Victoria counties)

P.O. Box 68
Baddeck, N.S.
B0E 2H0
(295-2554)

P.O. Box 130
Whycocomagh, N.S.
B0E 3M0
(765-2339)

CAPE BRETON SOUTH
(Richmond, Cape Breton counties)

Coxheath Depot
RR#6 Sydney, N.S.
B1P 6T2
(564-6389)

Provincial Building
St. Peter's, N.S.
B0E 3B0
(535-2032)

CROWN LAND FOREST MANAGEMENT

CROWN LANDS UNDER WOOD SUPPLY AGREEMENTS

Nova Scotia Pulp Limited, Point Tupper

The 50-year license agreement (wood supply and forest improvement) with Nova Scotia Pulp at Point Tupper involved 506 543 ha (1,251,668 acres) of Crown land in the seven eastern counties with additional area being added yearly. By 1986, a total of 607 042 ha (1,500,000 acres) will have been placed under company management.

In the calendar year 1983, 1 016 225 m^3 [stacked] (280,372 cords) of softwood pulpwood and 60 638 m^3 [stacked] (16,730 cords) of hardwood pulpwood were delivered to the mill from Crown lands. Of the softwood pulpwood 424 250 m^3 [stacked] (117,048 cords) were salvaged from blowdown and insect damaged material. In addition 4 284 m^3 [stacked] (1,182 cords) of hardwood fuelwood, 178,605 board feet of softwood sawlogs, 495,114 board feet of hardwood sawlogs; 12 972 m^3 [stacked] (3,579 cords) of softwood pulp and 3 936 m^3 [stacked] (1,086 cords) of hardwood pulp were produced for sale elsewhere. The agreement calls for an average annual allowable harvest of 1 196 104 m^3 [stacked] (330,000 cords).

Under the Forest Resource Development Agreement, funding was available for silvicultural treatments on Crown lands. As well, under the company's license agreement, the province returned to the company a

stumpage rebate for assistance in forest improvement work. During 1983 the following treatments were carried out: 1 691 ha (4,178 acres) of site preparation, 672 ha (1,660 acres) of planting, 1 735 ha (4,287 acres) of spacing, 31 ha (77 acres) of thinning, 656 ha (1,621 acres) of mechanical spacing and 25 ha (62 acres) of remnant removal.

All harvesting and forest improvement proposals are submitted to the department for prior approval in the form of annual cutting plans and annual silviculture plans. These show in detail the stands to be harvested or treated silviculturally. Field checks are made by the department staff before decisions are made. A second check is made by field staff during operations on approved jobs.

E. M. Comeau & Sons (1977) Limited, Meteghan, Digby County

An agreement signed on December 6, 1976, gave this company the right to cut stumpage on Crown land in the Blackadar Brook area of Digby County for a period of 10 years commencing September 1, 1975. During 1983 the company cut 213,023 board feet of softwood sawlogs, 6,726 board feet of hardwood sawlogs, 1 127 m^3 [stacked] (311 cords) of softwood pulpwood, 533 m^3 [stacked] (147 cords) of hardwood fuelwood and 127 m^3 [stacked] (35 cords) of hardwood lathwood.

Long Lake Lumber Limited, Shelburne

Long Lake Lumber Limited has two stumpage agreements on Crown lands. The first agreement was signed on December 4, 1979 and allows the company to cut stumpage on Crown land for a period of 10 years, commencing January 1, 1979.

The second agreement was signed on April 8, 1982 and it gives the company the right to cut stumpage on a 498-ha (1,230-acre) block of Crown land at Middle Ohio for a period of 10 years terminating December 31, 1991.

In 1983 the company cut 1,065,406 board feet of softwood sawlogs and 2,058 board feet of hardwood sawlogs under the 1979 agreement. There was no cutting under the new agreement in 1983.

Harry Freeman & Sons Ltd., Greenfield, Queens County

This license agreement signed January 1, 1979 allows the company to cut 300,000 board feet of sawlog stumpage each year during the full term of the agreement on a block of Crown land in Queens County.

An amending agreement was signed on October 13, 1983 which gave the company the right to cut 100,000 board feet of sawlogs per year on approximately 350 ha (865 acres) of Crown land in Shelburne County.

No cutting was carried out in Shelburne County under this agreement during 1983.

The company cut 398,969 board feet of softwood sawlogs, 8,646 board feet of hardwood sawlogs, 2 809 m^3 [stacked] (775 cords) of softwood pulpwood and 3 972 m^3 [stacked] (1,096 cords) of hardwood pulpwood in Queens County.

Caledonia Woodworkers Limited, Caledonia, Queens County

This agreement signed on August 4, 1979 gives the company the right to cut stumpage on Crown land for a period of 10 years, commencing January 1, 1979. During 1983 the company cut 793,134 board feet of softwood sawlogs, 1,904 board feet of hardwood sawlogs and 569 m^3 [stacked] (157 cords) of softwood pulpwood.

Scott Maritimes Ltd., Abercrombie Point

During the calendar year 1983 1,876,967 board of softwood sawlogs, 31 240 m^3 [stacked] (8,619 cords) of softwood pulpwood, 8 973 m^3 [stacked] (2,310 cords) of hardwood pulpwood and 1 772 m^3 [stacked] (489 cords) of hardwood fuelwood were produced from the 82 153 ha (203,000 acres) under the agreement. The agreement provides for the average production of 181 228 m^3 [stacked] (50,000 cords) annually.

Under an annual agreement this company received a stumpage rebate for the performance of silviculture on the licensed Crown lands. During 1983, Scott Paper Company carried out the following silvicultural treatments on Crown lands: 83 ha (205 acres) of site preparation, 62 ha (154 acres) of cleaning and 16 ha (40 acres) of shelterwood cutting.

All activities to be carried out on these lands must be submitted for prior approval in the form of a five-year management plan to the department. The plan must follow the guidelines agreed upon by the company and the province and show, in general, where operations are to take place, where products are to be extracted and the proposed road construction. These areas are checked in the field by the department staff and approval or otherwise is recommended. The annual cutting plan and the annual ailviculture plan identifies specific locations of various operations.

Riversdale Lumber Company, Truro

This 10 year stumpage agreement, signed in November of 1974 gave the company the right to cut 162 822 m³ (5,750,000 cubic feet) of wood products in Colchester and Halifax counties during the first five years. For the remaining five years of this agreement the company is granted the right to cut a maximum of 32 564 m³ [stacked] (1,150,000 cubic feet) of wood per year (exclusive of any deficiency carried over from the initial five-year period). In 1983, the company cut 4,561,658 board feet of softwood sawlogs, 11,404 board feet of hardwood sawlogs, 3 515 m³ [stacked] (970 cords) of softwood pulpwood, 6 644 m³ [stacked] (1,833 cords) of hardwood pulpwood, 2 867 m³ [stacked] (791 cords) of softwood studwood and 1 562 m³ [stacked] (431 cords) of hardwood fuelwood from their limits.

G. Royce Hefler Limited, Lower Sackville, Halifax County

This license agreement allows the company to cut a maximum of 1 416 m³ [stacked] (50,000 cubic feet) of merchantable softwood during the 10-year term of the agreement (September 8, 1977 to September 7, 1987).

During 1983 there were 49,054 board feet of sawlogs cut under this license agreement leaving a balance of 239,555 board feet.

Elmsdale Lumber Company, Elmsdale, Hants County

This license agreement covering a 10-year period signed on May 19, 1977, allows the company an average maximum cut of 6 796 m³ [stacked] (240,000 cubic feet) of softwood and hardwood.

During 1983 the company received 177,955 board feet of sawlogs leaving a balance of 5,634,872 board feet under this agreement.

Hoeg Brothers Lumber Limited, Athol, Cumberland County

This agreement signed on May 6, 1981 gives the company the right to cut stumpage on Crown land for a period of 10 years commencing January 1, 1981 and ending December 31, 1990.

During 1983, the company received 191, 237 board feet of softwood sawlogs.

Kingston Lumber and Building Supplies Limited

This license agreement grants the company the right for a term of 10 years (commencing on January 1, 1982 and ending December 31, 1991), to cut 300,000 board feet of sawlogs or studwood stumpage from those stands on Crown lands designated by the province.

In 1983, the company cut 329,819 board feet of softwood sawlogs, 1 018 m³ [stacked] (281 cords) of softwood pulpwood and 355 m³ [stacked] (98 cords) of hardwood pulpwood.

Canexel Incorporated, East River, Lunenburg County

The 10-year stumpage and roundwood sale agreement with Masonite Canada Ltd. (now Canexel Incorporated) signed in December, 1976, calls for the Crown to supply the mill with 36 240 m³ (10,000 cords) (75 per cent hardwood) on the company's request. Also the company can extract 54 368 m³ [stacked] (15,000 cords) annually from those Crown lands in the counties of Hants, Halifax, Annapolis, Kings, Lunenburg, Queens, Shelburne, Yarmouth and Digby which are especially allocated by the province via five-year management plans. This agreement also requires the company to submit annual cutting plans for its license lands.

Canexel purchased 19,491 board feet of softwood sawlogs, 612 board feet of hardwood sawlogs, 402 m³ [stacked] (111 cords) of softwood pulpwood, and 5 384 m³ [stacked] (1,485 cords) of hardwood pulpwood from the Crown.

Barrett Lumber Company Limited, Sackville, Halifax County

This license agreement allows the company to harvest forest products from August, 1979 until such time as they have received 742,842 board feet.

During 1983, approximately 10,174 board feet of softwood sawlogs were harvested leaving a balance of 508,890 board feet.

Nova Scotia Forest Products Association — Access Road Program

This program administered by the Nova Scotia Forest Products Association was initiated in 1967. It provides assistance to forest operators to build access roads for harvesting forest products, to carry out forest improvement work and to improve access for fire fighting. The assistance is in lieu of refunding the tax on gasoline and diesel fuel paid by forest operators for off highway hauling.

In 1983, a total of 349 applications were received, of which 315 applicants received assistance and completed their work under the program.

A total of 283.9 km (176.5 miles) of new forest access roads were built requiring 89,963 cubic yards of gravel and six new bridges. An additional 164.1 km (102 miles) of existing roads were upgraded using 12,248 cubic yards of gravel. Assistance totalled $805,000 on completed applications.

UNLEASED CROWN LANDS

Most of the unleased Crown lands are situated in the central and western parts of the province. The larger units or blocks have been placed under management plans drawn up in consultation with the Forest Planning Branch.

Access Roads

Construction was completed on approximately 49.6 km (31 miles) of forest access roads during 1983. Approximately 33.6 km (21 miles) were completed by contracts and the remaining 16 km (10 miles) were done under machine rental and department equipment. Four bridges were built and 15,000 tons of gravel crushed.

Hydro seeding was carried out along 86.4 km (54 miles) of road, in 13 parks and one rifle range.

Stand Improvement

The following stand improvement work was carried out on unleased Crown lands:

Treatment	Hectares	Acres
Planting	584	1,444
Cleaning	388	958
Merchantable thinning	145	359
Site preparation	523	1,293
Stand conversion	8	20
Shelterwood	49	121
Weeding	588	1,454
Pre-merchantable thinning	24	59
Release	16	41
Remnant removal	159	392
Salvage	10	25

Forest Products Sales

Fuelwood Sales

Letters of authority and standing permits were issued in 1983 to the many citizens requesting fuelwood. During the calendar year, 44 306 m^3 [stacked] (12,224 cords) of fuelwood were cut off unleased Crown lands and lands leased to the forest industries, cooperating with the provincial government.

Timber Licenses

Twelve licenses granting short-term cutting rights on parcels of Crown land ready to be harvested were issued to successful tenderers following advertisements.

Sales by Tender (Roadside)

Material produced on Crown land as a result of contracts or work by department crews is usually advertised for sale by tender. The successful bidder is then granted a letter of authority to remove the material. During the year 55 parcels of sawlogs, pulpwood, fuelwood and studwood, etc. were sold by letter of authority to the highest bidder.

General Letters of Authority

Authorization was given by letter of authority for the cutting and removal of forest products, aggregate material from beaches and inland deposits,

quarried rock and Christmas wreath material, and for other uses of Crown land on a short-term basis, as well as for construction of access roads. A total of 1,537 such letters were newly authorized during this fiscal year.

PRIVATE LAND FOREST MANAGEMENT

INDIVIDUAL ASSISTANCE

The Forest Resource Development Agreement was signed August 31, 1982 for a five-year period commencing April 1, 1982. The Forest Resource Enhancement on Private Lands Program was implemented and funded by Canada, while the province employed sufficient staff to prescribe, oversee and monitor forest management activities implemented by Canada on private lands.

Work assisted under this agreement as of March 31, 1984 is shown below. Group ventures are not included.

	Mgmt. Plans	Roads		Bridges	Boundaries		Ponds	Silviculture	
Year	No.	km	Miles	No.	km	Miles	No.	Hectares	Acres
1982-83	115	93	58	2	209	130	18	8 240	20,353
1983-84	318	149	92	10	557	346	98	9 923	24,509

At the end of the 1983-84 fiscal year a total of 536 applications for small private forest individual management plans were on file and an additional 147 applicants had plans being prepared. Department staff and forestry consultants prepared 404 plans during the 1983-84 fiscal year, to bring the total number of plans to 2,610 and the total area under management to 196 182 ha (484,569 acres).

Three pulp and paper companies and three large landowners continued to be active in the program. Three more large landowners have signed agreements with the Canadian Forestry Service and have begun forest improvement treatments.

For management plan and assistance details see Tables XVIII and XIX, Appendix.

GROUP FOREST MANAGEMENT

The object of the program is to increase the future harvest from private lands by encouraging the assembly of small woodlots into larger operating areas, and to provide for forest management of these operating areas. The

province and Canada now have agreements with eight groups: West Pictou Forest Owners Ltd.; North Nova Forest Owners Co-op Ltd.; Baddeck Valley Wood Producers Co-op Ltd.; La Fôret Acadienne Ltée; North Mountain Woodlands Ltd.; Sissiboo Forest Management Ltd.; Conform Ltd.; and Athol Cooperative Ltd.

As of March 31, 1984 these groups had 660 shareholders and 41 805 ha (103,302 acres) of woodlot under management. The average ownership per shareholder is approximately 63.5 ha (157 acres).

Operating and Administration

The groups claimed $515,138 for operating. Each group, under the direction of a board of directors, is responsible for cruising and preparing forest management plans for their shareholders' woodlots, coordinating these and other shareholders' plans into an annual operational plan, and selling forest products from forest improvement activities and commercial harvesting operations. The shareholders pay a management fee of five per cent of all wood sales (roadside price). This is credited to the group's operating accounts.

This year 1 780 ha (4,400 acres) were cruised and brought under management — down from 3 282 ha (8,110 acres) brought under management in 1982-83 and 7 899 ha (19,520) in 1981-82. This decline is a result of fewer group staff to activate the forest management plans and the reluctance by shareholders to accept revised forest improvement treatments and standards. However, wood sales increased (total sales were $798,500), resulting in an increased management fee contribution of $43,222 ($21,594 in 1982-83).

Forest Improvement Activities

The groups claimed $916,297 during 1983-84 from the Canadian Forestry Service for the following work (previous years shown for comparison):

	1983-84	1982-83	1981-82	1980-81
Road Construction, km (miles)	111 (69)	64 (40)	151 (94)	155 (96)
Boundaries, km (miles)	140 (87)	24 (15)	306 (190)	248 (154)
Ponds, number	14	3	29	42
Silviculture, ha (acres)	1 214 (3,000)	442 (1,364)	1 539 (3,803)	1 045 (2,583)

(For additional details, see Table XX, Appendix.)

Two groups carried out work in connection with job creation programs. Baddeck claimed $47,667 for work on 21 ha (53 acres), and North Mountain claimed $13,175 for work on 22 ha (55 acres). This work was classified as salvage cleanup and burning, stand improvements, remnant removal and clearcutting.

New Groups

Six requests for group forest management agreements were received from other areas of Nova Scotia.

PROTECTION SERVICES

FOREST PROTECTION (FIRE)

General Fire Situation

Nova Scotia experienced a very light fire season during 1983: 332 fires burned 448 ha (1,106 acres). Except for two weeks in June-July, when fire weather index readings reached record levels, the overall weather pattern remained overcast, damp and wet with timely rainfalls. All fires during 1983 were caused by people or people-related activities. (For forest fire statistics, see Tables XXI and XXII, Appendix.)

Aircraft

As a result of reduced fire activity, Nova Scotia experienced one of its quietest aircraft operating seasons for fire control purposes. A new 500D Hughes helicoptor was purchased during 1983 to replace a machine written off during 1982.

The makeup of the provincial aircraft fleet available for fire management during 1983 was:

Cessna 185 Sky Wagon	1
Beaver DHC - 2 (with bombing floats)	1
Hughes 500D	3
Bell 212	1

Equipment Development

During 1983 Nova Scotia purchased two "Bambi Water Buckets"; one Model 1214 which has a capacity of 547 l (120 imperial gallons) to be utiliz-

ed with the 500D Hughes helicopter; and one Model 3542 which has a capacity of 1 591 l (350 imperial gallons), to be utilized with the Bell 212 helicopter. Their use during 1983 was found to be satisfactory.

A status report has been prepared for *Smoke Signals*. Nova Scotia hosted the Fire Equipment Subcommittee of the Canadian Council for Forest Fire Control in April, and a very productive session was held.

Training

Several exercises were prepared for the fire training simulator. The intent is to offer the training to small groups, thus enabling field staff to participate as a unit.

The provincial dogmasters and dogs participated in a 10-day training and evaluation exercise with participants from the RCMP and the New Brunswick Department of Natural Resources.

Publications and Films

A manual of instructions for the fire communication trailer was revised due to the implementation of the integrated radio system. Work commenced on a two-year film project "Forest Fire Management in Nova Scotia" coordinated through the Forest Resources Education Subdivision.

HUNTER SAFETY EDUCATION

General

During 1983 the Hunter Safety Education Program continued to be very popular. A total of 15 new volunteer instructors were certified in various parts of the province. Several volunteer organizations are now conducting live firing as part of the course and all clubs have been encouraged to include this type of education in the course curriculum.

New legislation making it mandatory to wear hunter orange came into effect during the 1983 hunting season as planned, and was generally well accepted by the hunting fraternity.

Firearm Hunter Safety Courses

A total of 9,788 persons took the course, of whom 6,789 were first-time hunters. This was an increase of 598 over 1982.

Bowhunter Safety Education

A total of 271 bowhunters took the bow course, and one instructors' course was conducted in Sydney where eight new bow instructors were certified.

Hunting Accidents

Accidents increased slightly from 14 in 1982 to 18 this year. There was one fatal accident — the same number as in 1982. During 1983 the deer season was extended by six days and the number of hunters increased by about 10,000. This could have contributed to the slight increase in number of accidents. (See Table XXIII, Appendix, for a summary of hunting accidents).

LAW ENFORCEMENT

General

The department is completely responsible for the administration and enforcement of the Lands and Forests Act, Part I — Crown Lands, and Part II — Conservation of Forests; the Parks Act and Regulations; Beaches Preservation and Protection Act and Regulations; and the Forest Improvement Act. In enforcing these statutes, the department received assistance from the RCMP.

The department shares the responsibility with the RCMP of enforcement of the Lands and Forests Act, Part III — Game, and the Snow Vehicles Act. Also, the department assists the Canadian Wildlife Service and the RCMP in the enforcement of the Migratory Birds Convention Act and Regulations.

Approximately 110 Operations personnel become involved in all aspects of law enforcement in 1983-84.

Part I — Crown Lands

The number of persons charged for theft of products from Crown lands decreased again in 1983. It would appear the preventive patrols have had an effect.

Part II — Conservation of Forests

Most charges laid under Part II are for causing fire hazards and burning without a permit. Many hours were spent during the fire season investigating fire origins. A number of charges were laid against persons burning without a permit or permitting fire hazards on their property. Prosecutions decreased by about 10 per cent.

Part III — Game & Regulations

Department staff, assisted by the RCMP and federal fishery officers carried out many hours of enforcement. There were 140 prosecutions in 1982, and this year there were 90. "Jacking" prosecutions decreased from 68 to 49. The fine for "Jacking" ranges for $1,000 minimum to $2,500 maximum. In several cases the fines imposed were $1,500 to $2,000. There were no vehicles forfeited to the Crown.

Parks Act and Regulations

There were no major problems in the provincial parks during 1983. This could be attributed to the good work of our wardens, who have the prime responsibility of patrolling the parks with assistance rendered by the RCMP. Charges laid against persons totaled 76, the majority being for disturbances. This is a decrease of 51 from 1982.

Beaches Preservation and Protection Act

Our personnel are making extra efforts to prevent removal of beach material, and to prevent other beach area damage. One person was prosecuted this year for removal of beach material.

Migratory Birds Convention Act and Regulations

There were 26 charges laid under this Act, the same number as in 1982. Most of these charges were handled by the RCMP and the Canadian Wildlife Service, with assistance from our staff.

Snow Vehicles Act

On the rare occasion where violations under this Act relate to wildlife, the Department assists the RCMP in enforcing this statute.

For a breakdown of charges and offences in all above categories see Table XXIV, Appendix.

TABLE I
COMPARATIVE TABLE OF TIMBER PRODUCTS

CALENDAR YEARS 1982 AND 1983 (Common Units of Measure)

Product	Unit	1982	1983	Increase	Decrease
Lumber, softwood	Mfbm.	141,167	168,289	27,122	—
Lumber, hardwood	Mfbm.	8,702	6,857	—	1,845
Pulpwood	Cord	879,309	551,617	—	327,692
Pulp chips, residue	Cord	86,326	70,309	—	16,017
Railway ties	Mfbm.	1,641	1,566	—	75
Mine packs	Mfbm.	1,548	2,590	1,042	—
Pit props	Cord	3,397	7,272	3,875	—
Laths	Thousand pieces	5,395	4,373	—	1,022
Shingles	Squares	961	810	—	151
Staves & heading	Mfbm.	200	283	83	—
Poles & piling	Cord	710	287	—	423
Boxwood	Mfbm.	2,950	2,550	—	400

TABLE II - PROVINCIAL CROWN LAND FOREST PRODUCTION CALENDAR YEAR 1983 (COMMON UNITS OF MEASURE)

	Sawlogs[1]		Pulpwood		Fuelwood		Other Products**	
County	Softwood Mfbm.	Hardwood Mfbm.	Softwood m³(stacked)*	Hardwood m³(stacked)*	Softwood m³(stacked)*	Hardwood m³(stacked)*	Softwood m³	Hardwood m³
Pictou	—	—	55 020	10 793	217	1 548	—	—
Antigonish	—	—	28 859	7 182	—	1 280	—	—
Guysborough	23.0	—	27 996	11 667	1 993	5 496	—	22
Colchester	3 388.7	11.4	3 870	6 078	—	2 511	—	—
Cumberland	204.8	—	1 629	1 217	—	8 298	—	—
Hants	224.7	—	2 177	2 760	—	773	2 279	—
Halifax	1 728.5	—	19 839	6 000	91	2 111	—	—
Annapolis	984.0	8.4	3 075	1 559	—	3 521	—	—
Kings	372.6	23.6	2 888	4 748	—	370	—	—
Queens	1 277.6	15.4	3 729	4 756	—	1 147	—	—
Lunenburg	88.0	2.5	1 084	1 444	—	2 423	—	141
Digby	227.8	145.8	1 397	—	—	2 939	—	—
Yarmouth	14.5	3.7	2 333	—	—	636	—	—
Shelburne	1 400.9	2.1	—	—	—	939	—	—
Inverness	—	—	96 839	5 928	—	979	3 501	—
Victoria	10.1	—	117 882	1 010	132	1 710	—	12
Cape Breton	—	—	39 212	1 480	—	1 968	—	—
Richmond	—	—	4 994	—	7	1 817	—	—
TOTAL	9 945.2	212.9	412 823	66 622	2 440	40 466	5 780	175

1 Sawlogs include all products to be sawn

* m3 (stacked) based on 8 ft. (2.44 m) bolts

** Products not elsewhere specified converted m³ solid wood

TABLE III
PROVINCIAL CROWN LAND FOREST PRODUCTION
CALENDAR YEAR 1983
(CUBIC METRES SOLID WOOD)

County	Sawlogs		Pulpwood		Fuelwood		Other Products		Total	
	Softwood m³	Hardwood m³	Softwood m³	Hardwood m³	Softwood m³	Hardwood m³	Softwood m³	Hardwood m³	Softwood m³	Hardwood m³
Pictou	—	—	33 528	6 577	132	943	—	—	33 660	7 520
Antigonish	—	—	17 586	4 376	—	780	—	—	17 586	5 156
Guysborough	130	—	17 060	7 110	1 214	3 349	—	22	18 404	10 481
Colchester	19 191	65	2 358	3 704	—	1 530	—	—	21 549	5 299
Cumberland	1 160	—	993	742	—	5 057	—	—	2 153	5 799
Hants	1 272	—	1 327	1 682	—	471	2 279	—	4 878	2 153
Halifax	9 774	—	12 089	3 656	55	1 286	—	—	21 918	4 942
Annapolis	5 573	48	1 874	950	—	2 146	—	—	7 447	3 144
Kings	2 110	134	1 760	2 893	—	225	—	—	3 870	3 252
Queens	7 236	87	2 272	2 918	—	699	—	—	9 508	3 704
Lunenburg	498	14	660	880	—	1 476	—	141	1 158	2 511
Digby	1 290	826	851	—	—	1 791	—	—	2 141	2 617
Yarmouth	82	21	1 422	—	—	387	—	—	1 504	408
Shelburne	7 934	12	—	—	—	572	—	—	7 934	584
Inverness	—	—	59 011	3 612	—	597	3 501	—	62 512	4 209
Victoria	57	—	71 834	615	80	1 042	—	12	71 971	1 669
Cape Breton	—	—	23 895	902	—	1 199	—	—	23 895	2 101
Richmond	—	—	3 043	—	4	1 107	—	—	3 047	1 107
TOTAL	56 307	1 207	251 563	40 617	1 485	24 657	5 780	175	315 135	66 656

Conversion Factors: 1 mfbm: 200 cu.ft. : 5.663 36 m³ solid wood equivalent
1 cord 8 ft. bolts : 3.624 56 m³ (stacked) : 2.208 72 m³ solid wood
1 m³ (stacked) x 0.609 375 = 1 m³ solid wood

TABLE IV

PROVINCIAL CROWN LAND FOREST PRODUCTION, CALENDAR YEAR 1983
CUBIC MEASURE SOLID WOOD ROUNDWOOD LEVEL
PER HECTARE AND PER ACRE

County	PROVINCIAL CROWN LAND To March 31, 1983		PROVINCIAL CROWN FOREST PRODUCTION			PRODUCTION PER UNIT OF AREA	
			Softwood	Hardwood	Total		
	Acres	Hectares	m³	m³	m³	m³/ha	cu.ft./acre
Pictou	102,236	41 391	33 660	7 520	41 180	0.995	14.22
Antigonish	48,682	19 709	17 586	5 156	22 742	1.153	16.50
Guysborough	498,871	201 972	18 404	10 481	28 885	0.143	2.05
Colchester	125,682	50 883	21 549	5 299	26 848	0.528	7.54
Cumberland	152,295	61 658	2 153	5 799	7 952	0.129	1.84
Hants	93,739	37 951	4 878	2 153	7 031	0.185	2.65
Halifax	460,176	186 306	21 918	4 942	26 860	0.144	2.06
Annapolis	110,091	44 571	7 447	3 144	10 591	0.238	3.40
Kings	78,588	31 817	3 870	3 252	7 122	0.224	3.20
Queens	143,090	57 931	9 508	3 704	13 212	0.228	3.26
Lunenburg	91,542	37 061	1 158	2 511	3 669	0.099	1.42
Digby	184,558	74 720	2 141	2 617	4 758	0.063	0.91
Yarmouth	269,145	108 965	1 504	408	1 912	0.018	0.25
Shelburne	257,804	104 374	7 934	584	8 518	0.082	1.17
Inverness	302,789	122 587	62 512	4 209	66 721	0.544	7.78
Victoria	336,564	136 261	71 971	1 669	73 640	0.540	7.71
Cape Breton	119,146	48 237	23 895	2 101	25 996	0.540	7.71
Richmond	96,814	39 196	3 047	1 107	4 154	0.106	1.51
TOTAL	3,471,812	1 405 590	315 135	66 656	381 791	0.272	3.88

TABLE V
SPRUCE BUDWORM DEFOLIATION IN NOVA SCOTIA, 1979 TO 1983

Sector of Province	Year	DEFOLIATION CATEGORIES (hectares x 1000) Light	Moderate	Variable	Severe
Mainland					
Cumberland					
Colchester	1979	3.6	17.8	0	77.0
	1980	3.2	66.0	45.8	102.1
	1981	40.8	31.8	0	69.0
	1982	13.6	92.0	0	48.9
	1983	6.4	18.9	0	158.6
Northumberland					
Coast	1979	31.6	8.9	0	15.8
	1980	13.8	1.2	56.3	7.3
	1981	13.5	11.0	0	1.6
	1982	11.0	28.7	0	0.8
	1983	21.8	16.5	0	38.2
Annapolis					
Valley	1979	20.7	11.3	0	9.7
	1980	40.1	36.0	0	21.5
	1981	46.9	42.0	0	47.3
	1982	0	4.1	0	0
	1983	34.7	14.4	0	29.9
Cape Breton					
Island	1979	164.4	129.6	339.4	256.8
	1980	47.4	121.1	456.8	361.3
	1981	31.8	71.4	0	292.9
	1982	12.3	0.4	0	0
	1983	0.5	2.2	0	15.5
Total area of all categories of defoliation	1979	1980	1981	1982	1983
(thousands of hectares)	1 087	1 380	700	212	358
(thousands of acres)	2,686	3,410	1,730	524	885

SOURCES: From maps developed from aerial surveys of spruce budworm defoliation.

TABLE VI

SPRUCE BUDWORM EGG-MASS INFESTATION COUNTS PER 10m² IN NOVA SCOTIA, 1975 TO 1983

County	Year								
	1975	1976	1977	1978	1979	1980	1981	1982	1983
Richmond	203	430	649	364	403	423	15	2	4
Cape Breton	496	1608	524	437	349	378	17	7	2
Inverness	552	1319	758	389	316	308	50	151	13
Victoria	676	1832	771	435	647	258	27	50	14
Cumberland	263	191	71	218	307	235	197	622	203
Colchester	20	104	23	165	52	10	22	52	34
Pictou	23	29	125	140	214	116	13	103	68
Antigonish	135	196	182	252	65	136	79	228	92
Guysborough	0	6	78	—	8	0	8	19	4
Kings	12	12	25	73	183	245	86	245	228
Annapolis	16	18	27	121	165	224	72	331	29
Hants	11	6	6	0	19	61	12	5	11
Digby	6	11	20	—	3	86	36	42	9
Halifax	37	0	5	—	0	30	24	21	8
Lunenburg	6	0	6	9	16	10	15	20	6
Shelburne	3	0	12	—	8	28	4	2	2
Queens	3	4	4	0	0	—	6	11	1
Yarmouth	0	16	20	—	28	29	4	4	6

TABLE VII
COST OF AERIAL BTK. PROGRAM AGAINST SPRUCE BUDWORM OCTOBER 1, 1982 TO SEPTEMBER 30, 1983

Expenditures of the operational program to protect foliage of spruce (*Picea* spp.) and balsam fir (*Abies balsamea*) by the aerial application of a microbiological agent *Bacillus thuringiensis kurstaki* against feeding larvae of spruce budworm (*Choristoneura fumiferana* [Clemens, 1865]) in selected areas of Nova Scotia, 1 October 1982 to 30 September 1983.

CATEGORY	COST($)	PERCENTAGE OF TOTAL COST	COST ($) Per ha Flown
Salaries	174,596.70	23.92	8.42
Travel	11,100.49	1.52	0.53
Supplies & Services	483,036.16	66.16	23.31
Biocide	78,246.68	10.72	3.77
Aircraft	363,438.23	49.78	17.54
Lodging	25,646.35	3.51	1.24
Rentals	12,626.91	1.73	0.61
Trucking	3,077.99	0.42	0.15
Equipment	7,890.62	1.08	0.38
Others	53,414.23	7.32	2.58
TOTALS	730,038.20	100.00	35.22

TABLE VIII
FISH AND GAME LICENSE SALES BY COUNTY, 1983-84

County	Resident Big Game	Non-Resident Big Game (reduced fee)	Resident Small Game	Non-Resident Small Game (reduced fee)	Senior Citizen	Resident Fishing	Non-Resident Fishing	Resident Salmon (reduced fee)	Non-Resident Salmon	Furbearer
Annapolis	2,115	48 (2)	818	15 (1)	435	2,285	103	88 (4)	13	203
Antigonish	2,061	43 (2)	699	1 (0)	254	1,849	110	113 (1)	16	139
Colchester	5,278	114 (1)	1,601	7 (1)	729	6,088	217	465 (26)	95	296
Cumberland	5,409	174 (7)	1,757	23 (0)	854	4,361	246	247 (10)	40	439
Digby	2,824	35 (9)	1,138	10 (1)	494	1,603	57	20 (0)	5	149
Guysborough	2,192	59 (5)	894	3 (0)	307	1,956	191	322 (16)	107	223
Halifax	18,708	73 (2)	7,460	15 (0)	1,445	20,671	308	1,779 (75)	95	420
Hants	4,218	24 (1)	1,417	8 (0)	514	4,302	41	222 (8)	24	262
Kings	4,189	24 (0)	1,765	12 (0)	561	5,274	58	147 (6)	3	250
Lunenburg	5,318	26 (1)	1,920	1 (0)	739	5,439	99	733 (41)	45	241
Pictou	5,391	87 (3)	1,555	7 (0)	649	7,378	131	306 (18)	13	315
Queens	2,041	42 (1)	875	4 (1)	353	1,731	120	358 (19)	63	160
Shelburne	3,198	11 (1)	1,695	4 (0)	409	1,113	66	24 (0)	5	139
Yarmouth	3,846	41 (7)	1,740	13 (4)	536	2,088	133	140 (5)	5	227
Cape Breton	7,857	66 (3)	3,365	5 (1)	725	11,369	164	913 (58)	15	141
Inverness	2,630	85 (7)	1,191	4 (0)	218	2,960	500	286 (11)	303	154
Richmond	1,395	22 (6)	773	0 (0)	234	1,081	32	114 (9)	5	92
Victoria	853	19 (2)	414	3 (0)	109	755	116	109 (9)	22	79
TOTALS	79,523	993 (60) 1,053	31,077	135 (9) 144	9,565	82,303	2,692	6,386 (316) 6,702	874	3,929

TABLE IX
NOVA SCOTIA WILD FUR EXPORTS, VALUE TO TRAPPER 1981-82 to 1983-84

Species	1981-82			1982-83			1983-84		
	Number Exported	Average Price	Total Value	Number Exported	Average Price	Total Value	Number Exported	Aerage Price	Total Value
Beaver	3,761	22.46	84,472.	2,663	17.34	46,176.	2,141	19.80	42,392.
Muskrat	51,941	4.30	223,346.	42,929	3.43	147,246.	41,162	4.90	201,694.
Otter	571	50.89	29,058.	450	52.56	23,652.	426	57.01	24,286.
Mink	4,362	24.49	106,825.	3,622	16.75	60,669.	3,172	18.40	58,365.
Lynx	2	180.50	361.	3	229.98	690.	5	239.50	1,198.
Bobcat	1,722	155.28	267,392.	1,164	144.77	168,512.	1,041	102.99	107,213.
Fox	2,346	58.47	137,171.	2,320	52.84	122,589.	2,003	60.36	120,901.
Raccoon	12,362	27.36	338,224.	8,511	15.31	130,303.	6,042	15.85	95,766.
Weasel	1,148	1.21	1,389.	1,215	1.05	1,276.	962	1.44	1,385.
Squirrel	1,843	.90	1,659.	8,554	.71	6,073.	7,292	.37	2,698.
Skunk	23	3.50	81.	19	3.03	58.	10	2.98	30.
Fisher	45	160.02	7,201.	25	102.25	2,556.	48	60.72	2,915.
Black Bear	13	41.00	533.	30	45.32	1,360.	28	20.19	565.
Coyote	39	28.87	1,126.	72	22.70	1,634.	157	28.76	4,515.
Total Value			$1,198,838			$712,794			$663,923

TABLE X

NOVA SCOTIA WILD FUR EXPORT* STATISTICS: 1932-33 TO PRESENT

Year	Beaver*	Otter	Muskrat	Mink (wild)	Raccoon	Bobcat	Lynx	Fox	Weasel	Skunk	Squirrel	Bear*
1932-33	No Season	53	13,161	2,386	996	794	16	1,926	8,205	793	107	10
1933-34	No Season	78	17,341	2,769	1,423	775	18	1,815	6,135	262	548	7
1934-35	No Season	86	38,114	3,233	1,224	703	2	1,838	6,469	471	420	8
1935-36	No Season	107	34,019	3,122	1,027	589	8	1,714	9,790	349	10,115	3
1936-37	No Season	79	48,135	3,382	1,827	815	5	2,063	15,448	541	25,949	17
1937-38	No Season	105	51,349	4,082	1,678	452	15	1,291	9,472	317	12,441	10
1938-39	No Season	141	56,898	6,371	1,145	498	30	1,229	7,541	168	46,369	2
1939-40	No Season	77	48,860	10,598	1,315	488	62	1,154	7,729	97	9,361	3
1940-41	No Season	95	49,505	11,261	1,026	553	101	1,316	3,308	—	13,907	—
1941-42	No Season	162	54,694	12,309	1,555	1,119	130	2,665	6,476	271	9,762	132
1942-43	No Season	158	49,951	15,553	1,802	862	62	2,574	4,291	90	23,010	132
1943-44	2,789	186	47,733	7,460	1,803	1,193	44	3,659	9,464	143	17,577	161
1944-45	No Season	169	42,237	6,173	1,985	1,011	39	3,408	8,468	120	26,343	278
1945-46	7,320	255	49,653	7,396	2,298	812	11	3,589	9,719	107	95,052	386
1946-47	No Season	264	58,269	10,108	1,719	554	18	2,249	7,632	67	69,594	373
1947-48	No Season	245	50,600	13,002	1,896	389	27	1,232	7,658	39	51,375	409
1948-49	9,570	287	52,052	13,586	1,210	330	34	957	5,852	27	147,970	348
1949-50	No Season	260	39,046	13,552	1,264	315	17	826	6,527	26	24,516	318
1950-51	No Season	174	35,169	2,121	2,194	—	70	1,964	6,922	118	290,228	248
1951-52	7,633	210	41,988	18,015	2,129	336	23	1,632	7,023	13	43,531	219
1952-53	2,479	208	55,214	1,964	2,082	263	5	904	5,864	11	109,482	195
1953-54	3,075	174	57,185	2,253	1,852	248	10	553	5,509	8	82,743	169
1954-55	4,445	212	40,441	2,857	1,253	178	20	443	3,771	3	41,757	156
1955-56	3,113	232	40,756	2,111	1,354	332	51	405	2,245	1	6,706	172
1956-57	5,437	281	36,308	2,867	1,317	142	17	318	3,671	41	13,620	226
1957-58	3,002	258	26,459	2,006	1,266	261	32	657	1,898	364	3,468	164
1958-59	5,323	280	16,706	1,730	527	214	28	269	579	1	1,202	239
1959-60	2,791	185	11,906	1,047	624	151	1	322	395	2	760	236

* Figures for beaver and bear are not true export statistics. Figures for beaver represent the actual harvest tally. Figures for bear are those for bear bountied up to and including 1964; after 1964 they represent calculated bear kill from hunter and trapper reports.

TABLE X

NOVA SCOTIA WILD FUR EXPORT* STATISTICS: 1932-33 TO PRESENT (continued)

Year	Beaver*	Otter	Muskrat	Mink (wild)	Raccoon	Bobcat	Lynx	Fox	Weasel	Skunk	Fisher	Squirrel	Bear*	Coyote
1960-61	7,541	486	22,899	1,996	1,769	555	18	879	2,132	27	—	3,792	174	—
1961-62	3,958	409	17,437	1,864	1,028	377	70	906	986	5	—	3,709	139	—
1962-63	2,744	360	12,339	1,710	1,672	738	79	1,273	1,172	16	—	5,787	155	—
1963-64	2,998	320	21,243	1,990	1,585	657	24	1,109	731	14	—	1,101	162	—
1964-65	5,245	404	24,027	1,777	1,368	617	28	2,733	1,010	235	—	9,522	161	—
1965-66	2,883	591	22,677	2,312	2,276	1,334	97	2,692	2,988	27	—	2,928	256	—
1966-67	4,603	548	20,471	2,256	1,375	1,789	70	2,183	3,445	48	—	11,941	205	—
1967-68	2,488	519	17,565	1,536	1,337	1,567	163	1,492	1,161	8	—	1,758	163	—
1968-69	4,680	492	19,220	1,643	2,706	1,627	87	1,958	1,242	10	—	1,587	108	—
1969-70	3,508	564	29,590	1,908	3,382	1,729	218	2,797	804	34	—	1,035	218	—
1970-71	3,766	457	22,484	1,085	1,746	1,659	37	865	805	8	—	1,623	210	—
1971-72	3,318	665	24,362	1,882	3,659	1,963	47	2,327	215	6	—	303	175	—
1972-73	3,180	610	16,883	1,626	5,346	1,856	30	1,495	403	0	—	1,132	305	—
1973-74	3,757	595	38,117	1,777	6,462	1,320	24	1,924	753	6	—	2,583	113	—
1974-75	2,494	533	37,751	2,294	5,137	1,947	15	1,513	1,096	2	—	6,121	168	—
1975-76	409	202	29,309	2,351	4,715	1,997	0	1,862	1,073	91	—	2,397	249	—
1976-77	2,761	721	28,416	2,339	7,121	2,319	0	2,174	675	6	64	6,278	257	1
1977-78	3,075	594	50,406	3,428	7,355	2,423	39	2,397	548	43	34	2,670	271	1
1978-79	2,186	596	39,781	4,107	9,576	3,245	73	3,343	1,268	142	43	3,529	465	2
1979-80	4,130	672	35,946	3,860	10,946	3,170	45	2,908	1,071	76	48	4,385	831	6
1980-81	4,071	592	47,892	3,974	10,181	1,687	0	1,793	1,233	65	31	3,314	863	25
1981-82	3,761	571	51,941	4,362	12,362	1,722	2	2,346	1,148	23	45	1,843	546	39
1982-83	2,663	450	42,929	3,622	8,511	1,164	3	2,320	1,215	19	25	8,554	435	72
1983-84	2,141	426	41,162	2,172	6,042	1,041	5	2,003	962	10	48	7,292	422	157

* Figures for beaver and bear are not true export statistics. Figures for beaver represent the actual harvest tally. Figures for bear are those for bear bountied up to and including 1964; after 1964 they represent calculated bear kill from hunter and trapper reports.

TABLE XI
NUMBER OF SMALL GAME HUNTERS, 1978 to 1983

	1978	1979	1980	1981	1982	1983
Rabbits	31,343	28,376	23,928	26,061	28,463	27,959
Grouse	26,683	23,526	21,701	21,529	22,328	22,237
Wild pheasants	6,908	5,745	5,742	5,430	5,028	6,593
Preserve pheasants	515	625	612	517	632	591
Total pheasants	7,166	6,370	6,354	5,947	5,660	7,184
Hungarian partridge	675	860	883	702	878	722
Woodcock	2,846	2,267	2,107	1,515	1,829	1,806
Snipe	2,300	1,915	1,767	1,256	1,126	1,739
Upland Game	34,538	31,690	28,801	29,843	29,781	29,618
Black ducks	12,206	10,111	10,027	9,863	10,486	11,654
Sea ducks	4,908	5,001	4,358	4,352	4,435	4,789
Other ducks	7,665	7,176	6,153	5,895	6,722	8,041
Geese	6,440	5,164	5,036	4,631	4,338	5,871
Waterfowl	14,656	11,904	11,961	11,516	11,965	12,873

TABLE XII
SMALL GAME HARVEST, 1978-83

	1978	1979	1980	1981	1982	1983
Rabbits	641,370	532,184	323,336	379,862	547,566	508,124
Grouse	96,980	77,378	76,274	65,514	83,331	85,935
Wild pheasants	8,938	11,490	13,278	10,822	10,126	14,171
Preserve pheasants	2,172	2,188	2,446	1,773	3,973	1,805
Total pheasants	11,110	13,678	15,724	12,595	14,099	15,976
Hungarian partridge	1,174	1,641	2,004	1,071	1,548	1,083
Woodcock	10,158	5,823	5,537	3,360	3,094	2,952
Snipe	4,740	3,478	6,351	2,216	2,673	3,773
Upland game	765,532	634,182	429,226	464,618	652,311	617,843
Black ducks	57,905	41,694	60,454	41,711	47,327	71,911
Sea ducks	21,712	27,941	28,533	20,608	33,314	57,456
Other ducks	37,600	26,256	34,732	18,403	34,506	52,763
Geese	8,710	10,002	8,524	3,693	5,051	9,712
Waterfowl	125,927	105,893	132,243	84,415	120,198	191,842

TABLE XIII
AVERAGE HARVEST PER SMALL GAME HUNTER, 1978-83

	1978	1979	1980	1981	1982	1983
Rabbits	20.5	18.8	13.5	14.6	19.2	18.2
Grouse	3.6	3.3	3.5	3.0	3.7	3.9
Wild Pheasants	1.3	2.0	2.3	2.0	2.0	2.2
Preserve Pheasants	4.2	3.5	4.0	3.4	6.3	3.0
Total Pheasants	1.6	2.1	2.5	2.1	2.5	2.2
Hungarian Partridge	1.7	1.9	2.3	1.5	1.8	1.5
Woodcock	3.6	2.6	2.6	2.2	1.7	1.6
Snipe	2.1	1.8	3.6	1.8	2.4	2.2
Upland Game	22.2	20.0	14.9	15.6	21.9	20.9
Black Ducks	4.7	4.1	6.0	4.2	4.5	6.2
Sea Ducks	4.4	5.6	6.5	4.7	7.5	12.0
Other Ducks	4.9	3.7	5.6	3.1	5.1	6.6
Geese	1.4	19	1.7	0.8	1.2	1.6
Waterfowl	8.6	8.[illegible]	11.0	7.3	10.0	14.9

TABLE XIV

KELLY LAKE FISH CULTURE STATION STOCKING LIST, 1983

YEARLING SPECKLED TROUT

CAPE BRETON COUNTY		
Gammell Lake	(4613 6017)	7,000
COLCHESTER COUNTY		
Debert Ponds	(4526 6328)	7,000
CUMBERLAND COUNTY		
Blair Lake	(4548 6413)	4,000
DIGBY COUNTY		
Lake Midway	(4432 6603)	2,000
HALIFAX COUNTY		
Albro Lake	(4441 6335)	1,000
Bear Lake	(4502 6218)	500
Kelly Lake	(4503 6220)	3,027
Kindervator Lake	(4503 6218)	100
Maynard Lake	(4440 6333)	750
Mill Lake	(4454 6216)	100
Oathill Lake	(4440 6333)	750
Otter Lake	(4446 6324)	3,000
Penhorn Lake	(4440 6333)	1,000
Round Lake	(4504 6220)	500
HANTS COUNTY		
Meadow Pond	(4458 6405)	2,600
KINGS COUNTY		
Silver Lake	(4507 6436)	2,200
LUNENBURG COUNTY		
Becks Lake	(4421 6425)	5,000
New Canada Lake	(4429 6441)	2,900
QUEENS COUNTY		
Victoria Lake	(4400 6441)	2,500
SHELBURNE COUNTY		
Beaverdam Lake	(4340 6525)	2,000
	Total yearling speckled trout —	47,927

YEARLING RAINBOW TROUT

HALIFAX COUNTY		
Kelly Lake	(4503 6220)	3,538
Oathill Lake	(4440 6333)	3,500

Total yearling rainbow trout — 7,038

TABLE XV
LANDS RECONVEYED TO THE CROWN, 1983-84

COUNTY	HECTARES	ACRES
Annapolis	0	0
Antigonish	0	0
Cape Breton	0	0
Colchester	0	0
Cumberland	162	400
Digby	3	7
Guysborough	4	11
Halifax	206	509
Hants	0	0
Inverness	0	0
Kings	0	0
Lunenburg	0	0
Pictou	0	0
Queens	0	0
Richmond	21	53
Shelburne	59	145
Victoria	0	0
Yarmouth	0.08	0.2
TOTAL	455	1,125

TABLE XVI

LANDS RECONVEYED TO THE CROWN BY PURPOSE: 1983-84

PURPOSE	HECTARES	ACRES
Timber Reserve	357	883
Recreation & Park Reserve	89	220
Right of Way	5	12
Protected Area	4	11
TOTAL	455	1,126
Expropriation	41	101
Transfer of Administration & Control	1.4	3.5

TABLE XVII
LOCATION OF CROWN LAND AS OF
MARCH 31, 1984

COUNTIES	HECTARES	ACRES
Annapolis	44 552	110,090
Antigonish	19 701	48,682
Cape Breton	48 217	119,146
Colchester	50 862	125,683
Cumberland	61 785	152,675
Digby	74 689	184,560
Guysborough	201 904	498,915
Halifax	186 361	460,508
Hants	37 701	93,161
Inverness	122 535	302,789
Kings	31 803	78,588
Lunenburg	37 046	91,543
Pictou	41 375	102,239
Queens	57 907	143,090
Richmond	39 195	96,852
Shelburne	104 388	257,948
Victoria	136 203	336,564
Yarmouth	108 919	269,145
TOTAL	1 405 143	3,472,178

TABLE XVIII
NUMBER OF FOREST MANAGEMENT PLANS
SMALL INDIVIDUAL WOODLOTS, BY SUBDIVISION, 1983-84
CANADA—NOVA SCOTIA (F.R.D.A.)

	Applications				
Subdivision	On File	Being Processed	Completed and Signed	Completed and Signed Hectares	Acres
Cape Breton North	149	8	237	16 012.0	39,550
Cape Breton South	25	5	279	13 792.0	34,066
Eastern	125	40	448	41 630.0	102,826
North Central	49	56	289	24 176.6	59,716
South Central	26	5	299	26 683.8	65,909
Valley	112	23	355	24 200.0	59,774
South Shore	25	10	392	28 286.3	69,867
Western	25	0	275	21 401.6	52,862
TOTAL	536	147	2,574	196 182.3	484,570

TABLE XIX
SUMMARY OF FOREST MANAGEMENT ACTIVITIES ON PRIVATE LAND (INDIVIDUALS), 1983-1984

	50–5,000 Acres		5,000 Acres Plus		Pulp & Paper Co.		Total	
Category	**Unit**	**Assistance***	**Unit**	**Assistance***	**Unit**	**Assistance***	**Unit**	**Assistance***
Management plans	318	$367,660.56	N/A		N/A		318	$367,660.56
Access roads (built & under construction)	148.75 km (92.37 miles)	375,353.52	N/A		N/A		148.75 km (92.37 miles)	375,353.52
Bridges	28.8 m (94.5 feet)	15,308.28	N/A		N/A		28.8 m (94.5 feet)	15,308.28
Boundaries	557.05 km (346.13 miles)	159,302.60	N/A		N/A		557.05 km (346.13 miles)	159,302.60
Fire ponds	98	19,574.00	N/A		N/A		98	19,574.00
Silviculture	3 615.8 ha (8,931.1 acres)	1,229,447.59	634.1 ha (1,566.2 acres)	$167,226.80	5 672.7 ha (14,011.6 acres)	$667,759.85	9 922.6 ha (24,508.8 acres)	2,133,834.24
TOTAL	———	2,166,646.55	———	$167,226.80	———	$667,759.85	———	$3,071,033.20

* Assistance paid by Canada is recommended by the province.
Group ventures not included.

TABLE XX
GROUP FORESTRY MANAGEMENT ON PRIVATE LAND, 1983-84
PROGRESS REPORT SUMMARY

Group Venture	Operating Costs ($) *	Share-holders (No.)	Total No. of Mgmt. Plans	Total Area Under Mgmt. ha (acres)	Road Construction km (miles)	Ponds	Boundaries km (miles)	Silviculture ha (acres)	Forest Improvement Claim **	Volume of Wood sold M³ (ft.³)	Mgmt. Fee Contribution to Operating ($)
West Pictou	$ 66,452	123	133	5 658 (13,981)	12.4 (7.7)	1	38.8 (24.1)	164 (405)	$108,364	15 187 (536,320)	$ 7,740
North Nova	66,401	70	67	8 456 (20,895)	1.6 (1.0)	—	19.8 (12.3)	115 (285)	69,425	3 117 (110,080)	2,909
Baddeck	60,951	134	94	5 367 (13,262)	5.0 (3.1)	—	— —	91 (226)	73,088	10 184 (359,680)	5,600
La Forêt	64,000	84	106	2 717 (6,714)	7.2 (4.5)	—	19.0 (11.8)	88 (217)	88,055	9 678 (341,760)	6,292
North Mountain	60,000	57	69	2 647 (6,541)	2.9 (1.8)	2	4.0 (2.5)	127 (313)	67,217	2 465 (87,040)	1,735
Sissiboo	66,837	58	82	4 836 (11,950)	8.5 (5.3)	4	26.9 (16.7)	166 (409)	156,017	8 191 (289,280)	4,633
Conform	61,695	83	103	7 132 (17,624)	50.2 (31.2)	6	29.6 (18.4)	363 (898)	291,228	16 256 (574,080)	11,273
Athol	68,802	51	38	4 992 (12,335)	23.2 (14.4)	1	1.9 (1.2)	100 (247)	62,903	3 262 (115,200)	3,040
TOTAL	$515,138	660	692	41 805 (103,302)	111.0 (69.0)	14	140.0 (87.0)	1214 (3,000)	$916,297	68 340 (2,413,440)	$43,222

* Funded by Lands and Forests
** Funded by Canadian Forestry Service

TABLE XXI
SUMMARY OF FOREST FIRES BY CAUSE AND EXTENT, 1983

Cause	No. of Fires	Percentage of Total Fires	AREA		Percentage of Total Area
			Hectares	Acres	
Smoking	77	23	84.32	208.36	19
Camp fire	12	3	7.27	17.96	1
Incendiary	79	24	71.36	176.33	16
Chimney	0	0	0.00	0.00	0
Explosives	0	0	0.00	0.00	0
Power saw	1	1	3.70	9.14	1
Slash (per)	12	4	1.65	4.08	1
Slash (N. per)	11	3	2.98	7.36	1
Land clear	17	5	10.45	25.82	2
Burning debris	36	11	18.44	45.57	4
Burn rt. way	4	1	13.54	33.46	3
Locomotive sprk.	21	6	7.58	18.73	1
Other eng. sprk.	10	3	5.32	13.15	1
Miscellaneous	15	5	2.66	6.57	1
Unknown	37	11	219.32	541.95	49
Lightning	0	0	0.00	0.00	0
Total	332	100	448.59	1,108.48	100

TABLE XXII
NUMBER AND AREA OF FOREST FIRES
BY MONTH OF OCCURRENCE, 1983

Month	No. of Fires	AREA		Percentage of Total Fires	Percentage of Total Area
		Hectares	Acres		
January	0	0.00	0.00	0.00	0.00
February	0	0.00	0.00	0.00	0.00
March	20	49.70	122.81	6.02	11.08
April	103	267.20	660.26	31.02	59.56
May	35	20.22	49.96	10.54	4.51
June	74	34.25	84.63	22.29	7.64
July	36	59.26	146.43	10.84	13.21
August	23	4.54	11.22	6.93	1.01
September	32	3.56	8.80	9.64	0.79
October	7	7.32	18.09	2.11	1.63
November	2	2.54	6.28	0.60	0.57
December	0	0.00	0.00	0.00	0.00
	332	448.59	1,108.48	100.00	100.00

TABLE XXIII
SUMMARY OF HUNTING AND NON-HUNTING ACCIDENTS AND RELATED STATISTICS, 1983

County	Injury Hunting Accident	Non-Hunting Accident	Fatal	Total By County
Annapolis	2	—	—	1
Antigonish	1	—	—	1
Cape Breton	1	1	—	2
Cumberland	1	—	—	1
Colchester	1	—	—	1
Digby	—	1	—	1
Guysborough	—	—	—	—
Halifax	—	—	—	—
Hants	1	—	1	2
Inverness	1	—	—	1
Kings	1	—	—	1
Lunenburg	2	—	—	2
Pictou	1	—	—	1
Queens	—	—	—	—
Richmond	1	—	—	1
Shelburne	1	—	—	1
Victoria	—	—	—	—
Yarmouth	1	—	—	1
TOTAL	15	2	1	18

HUNTER SAFETY COURSES

First time firearm hunters	6,789	
Other firearm hunters	2,999	
Bowhunters	271	
TOTAL		10,059
Failures: Firearm	800	
Bowhunter	—	
TOTAL		800

COURSE GRADUATES INVOLVED IN ACCIDENTS

Firearm Course	5
Bowhunter course	—
TOTAL	5

** NUMBER OF HUNTERS & FISHERMEN, 1982

Big Game	73,548	Estimated rabbit hunters	28,463
Small game	29,769	Bear trapping	435
Moose	—	Furbearers	4,094
Fishing	79,809	Senior citizen fishing	5,000
Senior citizen big and small game	9,202	TOTAL	230,320

** PROSECUTIONS, 1982

Total prosecutions	606
Jacking, uncased gun and shining light prosecutions	140
Warnings	825

** GAME TAKEN, 1982

Deer	42,784	Grouse	83,331
Bear	435	Pheasant	10,126
Moose	—	Hun. partridge	1,548
Woodcock	3,524	Rabbits	547,566
Snipe	2,868	Furbearers	65,968
Black ducks	46,927	Trout	1,833,771
Sea ducks	15,581	Salmon	6,572
Other ducks	1,963	Geese	4,595

**Licenses, Prosecutions & Game Taken are for previous year as present year's statistics are not available.

GAME BEING HUNTED				TYPE OF WEAPON INVOLVED			
Moose	—	Furbearers	—	Shotgun	9	Muzzle loader	—
Deer	6	Bear	—	Rifle	7	Bow	—
Rabbits	7	Unknown	—	22 Cal.	2		
Birds	3	Non-Hunting	2				

CAUSES OF ACCIDENTS

Shooter stumbled and fell	3	Victim moved in line of fire	2
Victim mistaken for game	1	Weapon fell from insecure place	1
Trigger caught on object	—	Victim covered by shooter swinging on game	—
Unintentional discharge	—	Crossing fence or obstacle with loaded weapon	2
Horseplay with firearm	—	Removing weapon or placing in vehicle	—
Clubbing cover or game	—	Riding in vehicle with loaded firearm	—
Intentional discharge	—		
Unloading weapon	2		
Richochet off object	1		
Unknown	1		
Victim out of sight of shooter	3		

COLOUR OF CLOTHING WORN BY VICTIM

White	1	Blue	1	Yellow	1
Red	—	Dark	—	Orange fatal	1
Green	—	Other	4	Orange injury	10

TIME OF DAY ACCIDENT OCCURRED

6:30- 8:00 am	2	12:00-4:00 pm	6
8:00-10:00 am	3	4:00-5:00 pm	3
10:00-12:00 noon	2	5:00 pm-Dusk	2

COVER TYPE		VISIBILITY	
Dense	3	Clear	16
Light	4	Poor	—
Open	11	Overcast	—
Unknown	—	Dark	—
		Unknown	—

VISION	
Wears glasses	1
Colour blind	—
Unknown	—

ACCIDENTAL SELF-INFLICTED	
Fatal	—
Injury	4
TOTAL	4

AGE CLASS OF ACCIDENTS

	Shooter	Victim
Unknown	1	—
10-15	1	1
16-20	3	3
21-25	4	6
26-30	3	1
31-35	2	—
36-40	1	—
41-45	1	2
46-50	1	—
51 +	1	1

CHARGES LAID AS RESULTS OF ACCIDENTS	
Lands & Forests Act	1
Criminal Code	3
# Liquor Involved	—

MUZZLE TO WOUND DISTANCE (YARDS)	
0- 10:	11
11- 50:	5
51-100:	—
Over 100:	1
Unknown:	1

HUNTING EXPERIENCE OF SHOOTER

1 Year:	1	4 Years:	1	Over 10:	9
2 Years:	1	5 Years:	—	Unknown:	2
3 Years:	2	Over 5:	2		

OTHER STATISTICS RELATED TO GAME: SEASONS & LICENCE FEES, 1983

Deer: October 28 — December 3 all counties
Bag limit - 1 of either sex
License fees: Resident - $15.00; Non-resident - $75.00
Resident senior citizen - Free

Bear: Trapping - September 15 - December 15 (Residents ONLY - License Free)
Hunting - November 1 - November 30 (License fees: Resident - $15.00; Non-resident -$75.00)

Rabbits: November 16 - February 15 (Use of 22 Cal. weapon from December 5th ONLY)
Bag limit - None
No license required for residents.
Small game license for non-resident - $35.00.

Moose: No Moose Season in 1983.

Pheasant, Hungarian Partridge and Grouse:
Pheasant & Hungarian partridge in Annapolis, Kings, Hants & Lunenburg - November 1 to December 15. Remainder of province October 1 to December 15. Grouse, October 1 to December 15.
Bag Limits - Pheasants - 2 cocks per day, after first day no more than 4 cock birds. Hungarian partridge and grouse - 5 per day, no more than 10 after first day.
License fees: Resident - $10.00; Non-resident - $35.00; Resident senior citizen - Free.

Furbearers: Mink, muskrat, otter, beaver - November 1 to January 15, 1984. Fox, bobcat, weasel, red squirrel, skunk, fisher, raccoons - November 1 to last day of February 1984. Residents ONLY.
License fee, $10.00. NO snaring until December 15. See Trappers Summary for bag limits.

Fish and Migratory Birds:

Regulations and bag limits controlled by federal government. Provincial Salmon License: Resident -$10.00; Non-resident - $15.00.

Fishing License: Resident - $4.00; Non-resident -$15.00.

Federal Migratory Bird License $3.50. Provincial Small Game License also required.

TABLE XXIV
SUMMARY OF OFFENCES AND CONVICTIONS BY STATUTE AND COUNTY, 1983

A—Offences known or reported; B—Number of persons charged; C—Warnings issued

DISTRICT		L&F ACT PART I	L&F ACT PART II	L&F ACT PART III	PARKS ACT	BEACHES P & P ACT	SNOW VEHICLES ACT	MBC ACT	TOTALS
	A	14	—	42	—	—	—	—	56
Annapolis	B	9	—	3	—	—	—	—	12
	C	—	—	1	—	—	—	—	1
	A	7	—	71	5	5	—	9	97
Antigonish	B	—	—	6	—	—	—	3	9
	C	—	—	2	—	—	—	—	2
	A	5	8	705	16	18	—	27	779
C.B./Sydney	B	—	2	22	9	—	—	—	33
	C	—	2	46	2	—	—	—	50
	A	20	5	209	—	—	—	—	234
Colchester	B	—	5	23	—	—	—	—	28
	C	—	—	20	—	—	—	—	20
	A	—	1	80	—	1	—	—	82
Cumberland East	B	—	1	26	—	—	—	—	27
	C	—	—	—	—	1	—	—	1
Cumberland	A	—	—	32	4	—	—	1	37
West	B	—	—	11	—	—	—	—	11
	C	—	—	3	—	—	—	—	3
	A	—	3	194	4	9	—	1	211
Digby	B	—	—	38	—	—	—	—	38
	C	—	—	24	—	—	—	—	24
	A	8	6	25	—	—	—	2	41
Guysborough	B	—	—	6	—	—	—	2	8
	C	2	—	2	—	—	—	—	4
	A	4	14	165	20	3	—	34	240
Halifax East	B	—	2	51	4	—	—	9	66
	C	1	3	50	28	—	—	1	83
	A	2	42	197	57	6	—	6	310
Halifax West	B	—	2	29	34	—	—	3	68
	C	2	9	53	49	2	—	—	115
	A	1	8	188	3	—	—	—	200
Hants	B	—	—	64	—	-	—	—	64
	C	—	7	121	2	—	—	5	135
	A	10	7	161	10	1	—	0	189
Inverness	B	—	—	15	3	—	—	—	18
	C	—	7	79	—	—	—	—	86
	A	1	7	162	2	1	—	2	175
Kings	B	—	3	21	—	1	—	—	25
	C	—	2	100	—	—	—	—	102

TABLE XXIV (continued)

A—Offences known or reported: B—Number of persons charged: C—Warnings issued

DISTRICT		L&F ACT PART I	L&F ACT PART II	L&F ACT PART III	PARKS ACT	BEACHES P & P ACT	SNOW VEHICLES ACT	MBC ACT	TOTALS
	A	4	37	271	14	5	—	24	355
Lunenburg	B	—	3	55	3	—	—	—	61
	C	—	5	43	3	—	—	—	51
	A	2	—	210	7	34	—	—	253
Pictou	B	—	—	23	20	—	—	—	43
	C	—	—	2	9	10	—	—	21
	A	—	15	62	—	—	—	1	78
Queens	B	—	—	5	—	—	—	—	5
	C	—	10	5	—	—	—	—	15
	A	2	13	79	1	8	—	14	117
Richmond	B	—	—	18	—	2	—	3	23
	C	—	6	4	—	—	—	—	10
	A	—	4	44	3	1	—	10	62
Shelburne	B	—	—	4	3	—	—	6	13
	C	—	—	225	6	—	—	—	231
	A	—	6	54	3	—	2	9	74
St. Marys	B	—	—	5	—	—	—	—	5
	C	—	1	29	—	—	—	1	31
	A	7	5	114	3	—	—	6	135
Victoria	B	—	—	17	—	—	—	—	17
	C	4	—	81	2	—	—	—	87
	A	2	15	95	4	2	—	1	119
Yarmouth	B	—	3	13	—	—	—	—	16
	C	2	3	7	4	2	—	—	18
	A	89	196	3,160	156	94	2	147	3,844
TOTAL	B	9	21	455	76	3	—	26	590
	C	11	55	897	105	15	—	7	1,090

For year ending December 31, 1983:

Number of prosecutions for jacking 49
Number of prosecutions for uncased guns 29
Number of prosecutions for shining lights 12
Number of complaints of jacking
(Lands & Forests Offices only) 576